HT, MARCH 19, 1936

FIRST AERO WEEKLY IN THE WORLD

REGD. AT THE G.P.O. AS A NEWSPAPER

MAR 30 1936

FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

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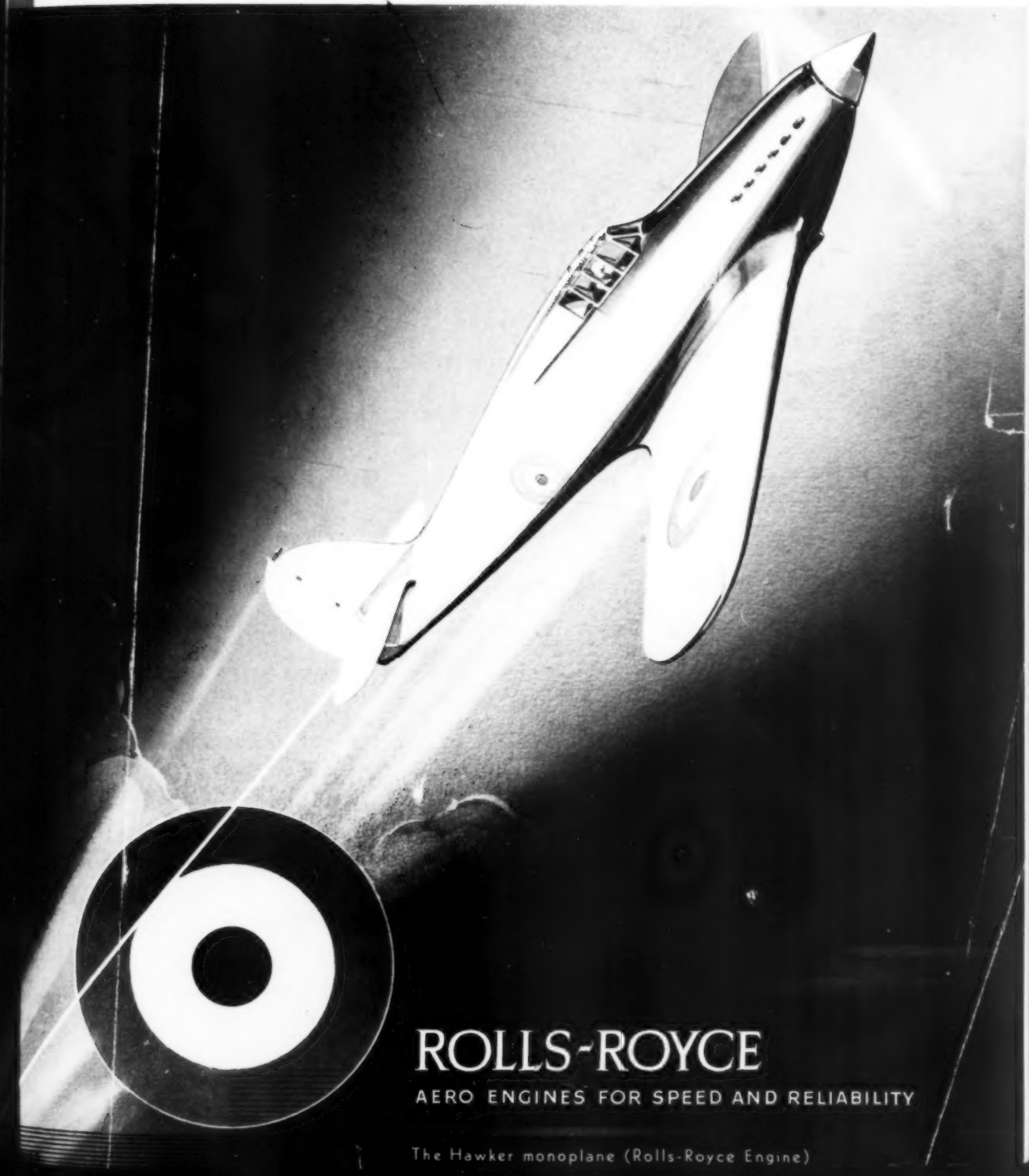
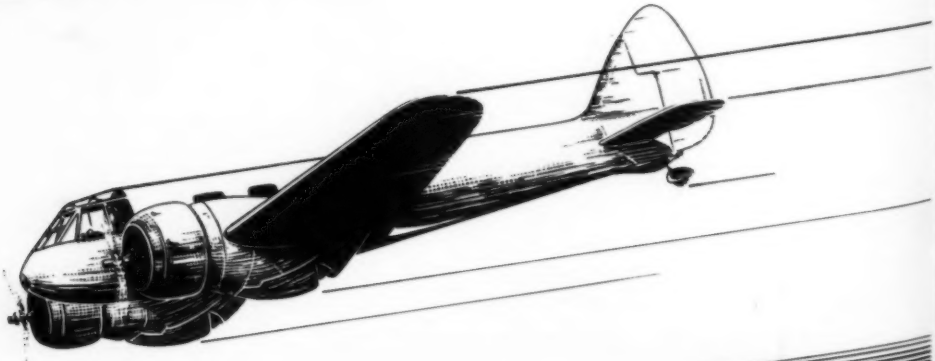


MODERN PERFORMANCE



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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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Impartiality

MR. BALDWIN has sprung a surprise upon the country by selecting Sir Thomas Inskip as Minister of the Crown for the Co-ordination of Defence—that is to say, as Deputy Chairman of the Committee of Imperial Defence and of the Defence Policy and Requirements Committee. The chief qualification of the new Minister for this new post seems to be that he is completely without knowledge or experience of any of the three fighting Services, and, therefore, must of necessity be impartial in dealing with the problems of co-ordinating their needs and their contributions to the common object of defence. The experience of Sir Thomas in the Naval Intelligence Division and as head of the Naval Law Branch of the Admiralty during the war is not likely to have given him any preconceived ideas on the subject of naval defence, still less to have prejudiced him in favour of the Admiralty. Of defence in general he would seem to be as ignorant as he is of any one of the Services. For all that, he is an eminent King's Counsel, and barristers can only attain to silk through a power of assimilating a brief at great speed and mastering the details of a subject of which they had no previous knowledge. Only by means of that ability are they able to meet expert witnesses and question them on equal terms. Defence is a subject no more intricate than many others on which barristers have to address juries. We may recall the brilliant success of Lord Haldane at the War Office, and the equally brilliant reports which Sir John Simon wrote on India and on the disaster to R.101.

It is, perhaps, somewhat cynical to lay much stress on Sir Thomas' ignorance of the subjects with which he will have to deal. The present critical situation doubtless impelled the Prime Minister to select a man who was capable of learning his subject rather than one like Mr. Churchill or Sir Samuel Hoare who had already learnt it. Both of those politicians are eminently suitable for the post which has been given to Sir Thomas Inskip—though Sir Samuel might be considered under suspicion by the two older Services, because he has been said to have been bitten by a mad aeroplane. But political reasons of the moment have ruled both of them out. Sir Samuel has recently resigned a Cabinet post, and it might be thought an affront to certain foreign interests if he were to be received back into the fold so soon. Mr. Churchill is, by experience at all three Ministries and by natural ability as an organiser and administrator, the man obviously marked out for this new post. Had the times been normal and peaceful he would almost certainly have been chosen for it. But in such ticklish times—there is no less slangy word which so accurately describes the present situation—the appointment of Mr. Churchill might have been taken as a bellicose gesture on the part of Britain, and Mr. Baldwin has obviously decided that the present is not the moment for running such a risk. He has therefore played for safety and chosen a safe man.

Not a Superman

Sir Thomas himself has shown wisdom and sobriety in his own remarks about his appointment. "I do not claim to be a superman," said he; "I am not a Minister of Defence. . . . I shall be the link between the different departments of this country connected with defence. I shall make it my particular care that the matters concerning different departments in connection with the provision of fresh equipment for the defence forces shall be considered in the right way." On those lines Sir Thomas may well do very useful work. He may, in fact, he certainly must, put an end to manœuvring by departments to get the most out of the Treasury at the expense of others. He may not decide that the War Office must hand the anti-aircraft guns and searchlights over to the R.A.F., but at least he should be able to see that the War Office does not cancel Territorial camps at the time of the Air Exercises, and also that there is no delay in serving out the latest patterns of guns, lights, and sound locators needed for air defence.

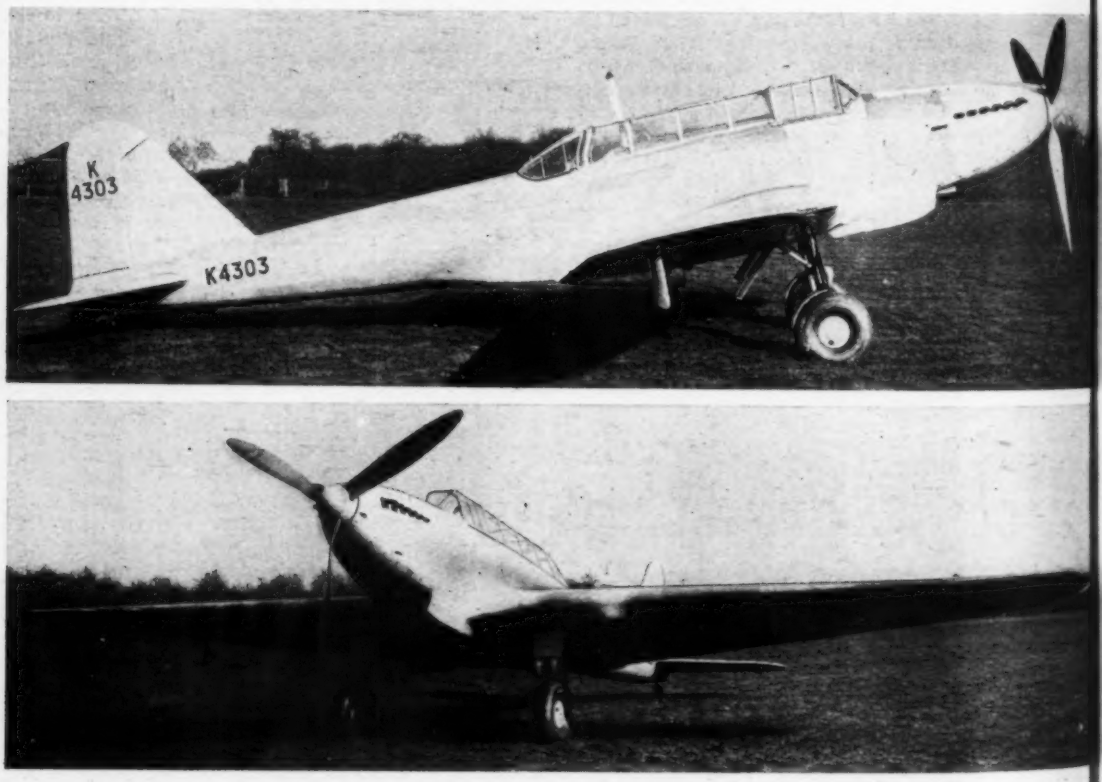
The Australian Case

NOT a little consternation has been caused by Australia's refusal to fall in with the plans of the Home Air Ministry and Post Office for a through service of flying boats to Sydney, carrying Empire mails at a flat rate of 1½d. per half ounce. There seems to be a good deal to say on both sides, and the Australian case, as put by correspondents in the daily papers, deserves careful examination.

From the first *Flight* has realised that it is unthinkable that the old Qantas service through northern Queensland —Camooweal, Cloncurry, Longreach, Charleville, Brisbane—should be given up. It is one of the most useful air lines in the world, and now that the people of the huge grazing districts which are served have grown accustomed to depend on the aeroplanes to keep them in touch with medical aid and all the other benefits of civilisation, it would be sheer cruelty to deprive them of that service. The plan put forward from Britain disregards that inland route, which is also the most direct way between Darwin and Brisbane, and contemplates sending flying boats from Darwin across the Gulf of Carpentaria and down the Queensland coast to Brisbane and Sydney. The Australian Government has all along decided that it would control and subsidise the section of the Empire route south and east of Singapore, so that if the flying boat plan were adopted, Australia would have to pay a subsidy for the coast route. To expect the Commonwealth to subsidise two air services between Darwin and Brisbane would be asking too much, and without a subsidy the old Qantas service would l guish and die.

So far as is known, the only reasons why the c route by seaplane has been put forward are: (1) beca Imperial Airways wish to adopt the K.L.M. system sending one aircraft all the way through without chan instead of sticking to their present system of chang types at Paris, Brindisi, Alexandria, Karachi, a Singapore, and (2) in order that the flying boats may ready to fly on from Sydney to New Zealand so soon arrangements are made for that extension. On the fa of it, these reasons are not weighty enough to justify abandonment of the inland service across Queensla and Australia seems not only well within her rights b also acting quite reasonably in declining to agree to th proposal. Up to Darwin there are very good reasons f using the flying boat, but between Darwin and Brisba and even Sydney, the weight of argument is on the si of the internal landplane service. When the time co to extend to New Zealand another arrangement ca made.

The financial side of the question is more complicate Australia has been accustomed to making a substanti surcharge on air mail letters, and objects to the idea carrying Empire letters at the flat rate of 1½d. per h ounce. For internal letters there is also a surcharg and it would be rather farcical if a letter from one pa of Australia to another cost more than a letter from Au tralia to England. Cheap postage, we believe, is alwa the best policy in the long run, and it is to be hoped th some Rowland Hill will arise in Australia to convert t Government to that doctrine.



A LA MODE: **The veil of official secrecy has been partially lifted from the shapely Fairey bomber monoplane, known as the Battle. Its engine is one of the new Rolls-Royce "Merlins"; its covering of metal; its undercarriage semi-retractable; and its performance, if known, a State secret.** *(R.A.F. Official Photograph. Crown Copyright.)*

The Outlook

A Running Commentary on Air Topics

Landplanes for the Atlantic

THE first official intimation that the two new De Havilland four-engined monoplanes now being built for the Air Ministry are intended to be used for transatlantic tests was disclosed by the Director-General of Civil Aviation during his lecture at the R.U.S.I. last week. To be sure, Sir Francis Shelmerdine did not specifically mention the new De Havilland machines, but merely stated that two aeroplanes were being built which would be able to operate the service during the summer, and possibly even during the winter. There can, however, be little doubt that the machines referred to are the two D.H.91s.

It may be recollected that shortly after the England-Australia Race Capt. Geoffrey de Havilland explained in a lecture the sort of features which a "scaled-up" Comet might have, and pointed out that in a large edition of the winner of the race the fuselage would be of such dimensions as to give space for a reasonable pay load. In the Comet the accommodation was necessarily limited.

The D.H.91 may, therefore, be expected to resemble the Comet somewhat, although one may assume that considerable differences will be found when the new machines emerge in the autumn. For instance, the use of four engines instead of two will occasion some departure from the Comet layout. In other respects one may foresee changes being made, and the "scaled-up Comet" simile should probably not be taken too literally.

With the introduction of these four-engined monoplanes on the transoceanic route, the old controversy of seaplane versus landplane is likely to be revived. Presumably the D.H.91s will be used on experimental flights first of all, and possibly afterwards for carrying mails. It may be taken for granted that they will be so designed that in the event of descent on the water they will float for considerable periods, and thus would be in no worse case than the flying boat which had managed to alight safely in a rough sea, but was unable to take off from it again. A lot of data and a great deal of experience will be necessary before it is possible to decide definitely on the relative merits of the flying boat and the landplane for this kind of work. Probably the company is designing for general use on long-range routes, and if the stages happen to be over water that is rather incidental.

The King's Cup

WHEN the preliminary regulations for the 1936 King's Cup air race were first announced (*Flight*, February 13, 1936), we pointed out on this page that it seemed illogical to class all twin- or multi-engined aircraft together, irrespective of power, in the eliminating contest. The Royal Aero Club now announces that a modification has been made in the regulations. The division into three classes remains: (*a*) machines under 150 h.p., (*b*) machines over 150 h.p., and (*c*) multi-engined machines, but the multi-engined aeroplanes are not confined to class (*c*), and may be entered either in (*a*) or (*b*) according to their horse-power.

This is a great improvement, and should do much to encourage owners of multi-engined aeroplanes to enter for the race. It seems likely that the number of twin-engined entries of under 150 b.h.p. will not be large, but there may be one or two. Under the new regulations these *may* be entered in class (*a*); apparently the rules do not compel them to be entered in that class, should the entrants wish to put them in (*b*) for any reason. Unfortunately (for the entrants) it is stipulated that entrants must specify at the time of entry the class in which they wish to compete. Thus it will not be possible for any entrant to wait until he knows what he is "up against" before selecting his class.

It may be remembered that 50 per cent. of the machines in each class to finish the eliminating contest in the fastest time will go into the final, where they will compete on handicap. There is, however, a limit of ten machines in each class, so that the greatest number of machines in the final for the King's Cup cannot exceed thirty.

The decision to provide a special class for multi-engined aeroplanes is to be applauded. There is a great deal to be said for encouraging the twin-engined machine, and now that the classification has been made more rational there should be a large entry in class (*c*).

The race takes place on July 10 and 11.

Airships and the U.S.A.

AIRSHIP experts are agreed that the American naval airships *Akron* and *Macon* were faultily constructed (they were too heavy) and that something went wrong at the time of each disaster. Their failures do not vitiate the case made out for airships by Dr. Eckener and the *Graf Zeppelin*. Recently a committee was appointed from the President's Science Advisory Board, at the request of the Secretary of the Navy, to review and analyse the past and present situation as to the design and construction of airships, and to make recommendations for the future. Dr. W. F. Durand was at the head of the committee.

The committee has reported that it is possible to design, construct, and operate airships, especially of the larger sizes, with a reasonable assurance of safety and with a presumptive life which would demonstrate their capacity for useful service either for the Navy or as commercial craft. It considers that naval airships could be used; non-rigids for coastal patrol and detection of submarines and mines and to guide troop convoys and naval vessels through mine fields, and rigids for strategic reconnaissance and as aeroplane carriers. For commercial purposes, small, medium, or large airships can be made useful, according to traffic requirements.

It remains to be seen what action will be taken.

Ordinary Transport

THE British Post Office was slow to recognise air transport as a real help in the speedy delivery of mail, but, having once taken the plunge, it has, so to speak, gone right in off the deep end. We were all delighted when it was announced that inland letters should go by air without surcharge—in fact, without consulting the sender on the subject at all—whenever there would be an advantage in using the air. It was a still greater conception to scheme an Empire flat rate of 1½d. per half ounce.

Now our letters are to be carried to four countries abroad by air without any surcharge. One would think that a saving of twenty-four hours in getting a letter to Denmark, Sweden, Norway and Finland would be worth some extra charge, but none is to be made. The aeroplanes of British Airways are to be used as the normal way of getting mail up to those countries—normal, that is to say, so far as cost goes, though quite abnormal in their excess of speed over older transport. The official start of the service last Tuesday was certainly a landmark in the history of British mail transport.

FLAPPED EFFICIENCY

Easy Approach Characteristics of A.S.6 Envoy Series II : Lower Landing Speed

WHEN the necessity for combining commercial efficiency with higher speeds inevitably drove designers to reduce drag as far as was practicable, it was obvious that some means had to be evolved for reducing this inspired cleanliness at will. No aerodrome in the world would be large enough—or, at least, sufficiently free from obstructions—for a machine in which the reduction of parasitic drag had been carried to its logical conclusion.

With the arrival of the modern conception in high-speed transport machines, therefore, there came also the flap. Originally developed with the idea of increasing lift and thereby lowering the landing speed of machines with a high wing loading, flaps are looked upon by pilots, at least, almost entirely in the light of their capacity for steepening the approach.

Certainly there can be few transport aeroplanes with an approach as steep as that of the latest Envoy with its split trailing-edge flaps lowered. Furthermore, this machine can be brought in safely at a speed which would hardly be credited by anyone who had not actually watched the A.S.I.

Translated into bald figures, the stalling speed of the Series II has been reduced by 9 m.p.h. with the help of these flaps, and the landing run has been reduced by 50 per cent. or thereabouts. In its unflapped form the Envoy stalls at an indicated 55 m.p.h. ; the touch-down now takes place with the needle lying between 40 and 45 m.p.h. An average of twelve landings in a 5-m.p.h. wind gave, it is understood, a figure of 140 yards for the landing run. It was found, however, that the increased drag virtually balanced the increased lift during the take-off, which we roughly timed as taking 13 seconds in a 10-m.p.h. wind with a medium load.

Unfortunately, the most pronounced effect of the flaps—during the approach—cannot be indicated with the assistance of figures, but can only be seen and felt. At a gliding speed of 60–65 m.p.h. this flapped approach can best be described as being as steep as that of a training type. At 50–55 m.p.h. it is even steeper, though the attitude of the machine is, of course, somewhat nose-high and the sink is pronounced enough to demand a little extra speed before holding off for the landing.

Nor is any particular skill required for a short landing. Flt. Lt. C. H. A. Colman, of course, as the Airspeed

An Airspeed trio : From left to right they are Flt. Lt. C. H. A. Colman, the demonstration pilot ; Mr. F. H. Turner, the sales manager ; and Mr. G. B. S. Errington, the chief test pilot. (*Flight* photograph.)

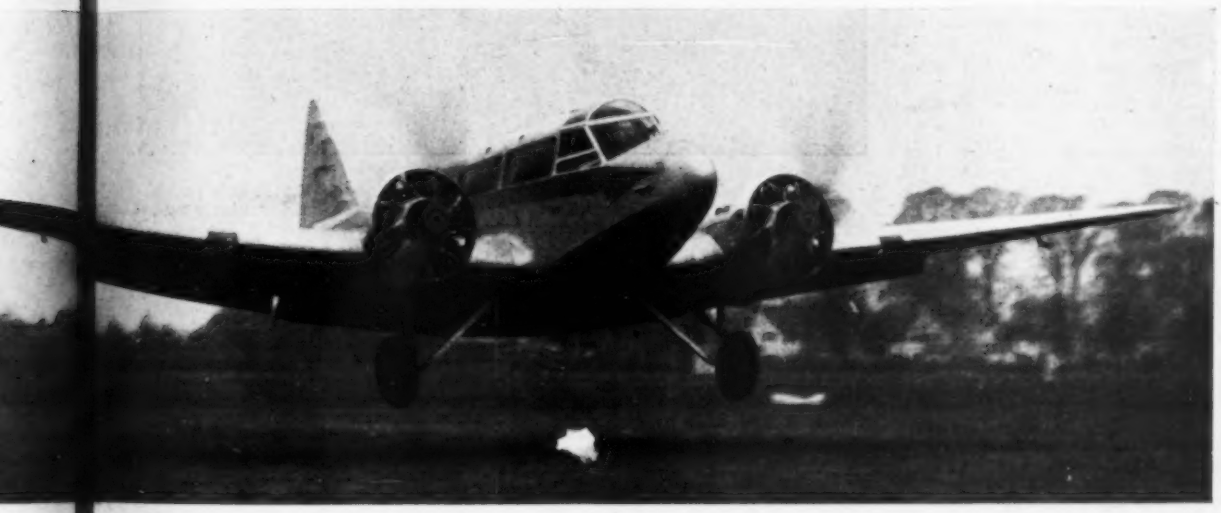
AIRSPEED A.S.6 ENVOY SERIES II
Two Wolseley Scorpio 250 h.p. Engines

Weight empty (with normal and electrical equipment)	2,572 lb.
Cabin equipment	148 lb.
Disposable load	2,063 lb.
Total all-up weight	5,900 lb.
Maximum speed	173 m.p.h.
Cruising speed at 75 per cent. power	153 m.p.h.
Cruising speed at 62½ per cent. power	144 m.p.h.
Range at 62½ per cent. power	685 miles
Climb to 5,000 ft.	6 min.

demonstration pilot, can make the new Envoy do some very remarkable things, but, at the Heston demonstration last week, at least two pilots having no previous experience of the machine made approaches and short landings which would not have disgraced the pilot of a light aeroplane.

Despite the many statements made by research experts, Mr. Errington, the chief test pilot, claims that the flaps-down stall is quite innocuous and that the Envoy, which has, in addition, rather pronouncedly tapered wings, does not tend to drop a wing even from a full stall. The loss of height, he says, is quite a lot less than in the case of the unflapped type—approximately 300 ft. as compared with 500 ft. indicated on a sensitive altimeter. If the machine is trimmed correctly for a 65 m.p.h. glide the effect of lowering the flaps is merely to depress the nose with no change in the indicated air speed. Aileron control remains down to the moment of stall.

The normal hydraulic gear which is used for the retractable undercarriage is also used for the flap operation. It may be remembered that, on previous Envoys, a pump handle and a change-over lever are placed to the right of the pilot. With the Series II a third lever is placed on the pilot's left, beside the tail-trimming wheel; according to



Safe and slow: Flt. Lt. Colman makes a demonstration landing just over the Heston boundary marks. In the heading picture the new Envoy is shown in cruising trim. (*Flight* photographs.)

its position the normal "up or down" control and the pump handle operate either the undercarriage or the flaps. In the experimental model, at least, the flap position is indicated by means of a pointer on the right-hand side of the control cabin.

In the air there is little chance that the pilot might make a mistake, since, with the undercarriage still up, the warning syren would indicate the fact as soon as the engines were throttled back, and, in any case, feel, sound and sight would tell him that the flaps, rather than the undercarriage, were being lowered. A very careless pilot might possibly pump the undercarriage up while the machine was on the ground, but in just the same way, he might also do a number of other foolish things in any aeroplane. One of the more interesting flying characteristics of the Envoy, incidentally, is that the take-off is best made tail down—with the trimmer wound well back. As soon as the machine leaves the ground the wheel can be wound forward again before attending to the undercarriage pump.

The particular machine used for the demonstration was fitted with Wolseley Scorpio engines which, when turning over at 2,200 r.p.m. gave a cruising speed of approximately 150 m.p.h. The Rotax electric starters were noticeably quiet and efficient in action.

High performance for a modest power expenditure has been a feature of all Airspeed machines since Messrs. Tiltman and Norway first introduced the Courier some years ago. That machine, it may be remembered, was the first British low-wing monoplane to be fitted with a retractable undercarriage, and showed the way to still greater efficiency. The maximum speed of 173 m.p.h. with two Wolseley Scorpio engines corresponds to an Everling high-speed figure of 23.7, which must be regarded as good for a twin-engine type. At the same time the structural efficiency is good at 1.63, showing that, when equipped for passenger carrying, the Envoy carries as disposable load 63 per cent. of its own weight.

In three sections extending right across the centre section, the Airspeed split flaps are hydraulically operated. (*Flight* photograph.)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

IN consideration of a substantial cash payment, the German aircraft industry has acquired the right to use the Handley Page slotted wing patents.

The Avro Anson contract from Australia is for six machines.

A round-Germany flight by the new Zeppelin has been postponed.

The first Supermarine Seagull V amphibian has arrived in Australia.

Experiments are now being carried out at Ashington, Essex, with a two-seater *Pou* intended for tuition.

Strikers at the Hayes and Stockport works of the Fairey Aviation Company returned to work on Monday.

De Havillands have an important contract for Queen Bee wireless-controlled target machines.

Mr. Filson Young's broadcast talks, "Growing Wings," are being embodied in a book of the same title to be published in a few weeks.

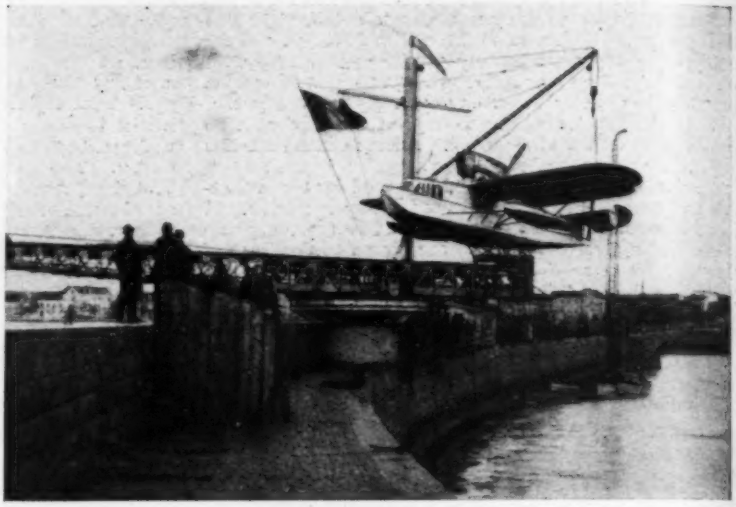
Mussolini's two eldest sons have been recommended for silver medals for gallantry in service with the "Disperata" squadron.

The Palace of Engineering at Wembley Exhibition grounds, which has a floor space of 600,000 sq. ft., is among a number of sites which are being considered for a new Air Ministry establishment.

Twenty-five Years Ago

(From "Flight" of March 18, 1911.)

"Mr. Haldane, in his statement in connection with the Army Estimates, said: 'Now I come to aeroplanes. We have purchased five, which are available for practical instruction. Three are of the latest pattern, the Farman, Paulhan, and Havilland. Besides that we have just completed the purchase of four additional biplanes from Sir George White, of Bristol, of the British and Colonial Aeroplane Co. They are to be delivered in April, and Sir George White has got an establishment of skilled pilots with whom we hope to work on Salisbury Plain.'"



TEST BED: This catapult is intended for installation on the French cruiser *Lorraine* and here is seen installed on a jetty at Saint Nazaire for preliminary tests. The machine is a Loire 130 reconnaissance flying boat with 690 h.p. Hispano X engine.

Cyclonic Production

The U.S. War Department has awarded the Wright Aeronautical Corporation a £770,000 contract for 512 engines, mainly, it is believed, of the Cyclone type. Of these, 328 will be installed in and used as spares for the eighty-two new Douglas bombers; 104 are for the thirteen Boeing 299s.

Speeding-up Surveying

The first large-scale air survey made in New Zealand was recently carried out by a Royal New Zealand Air Force Vildebeeste, piloted by Flt. Lt. M. W. Buckley. The work, which is the first step in the production of a complete topographical map of New Zealand, was carried out in forty-eight flying hours over an area of 1,000 square miles in the Hawke's Bay district. It would have taken three years by the normal method of survey.

His Majesty's Aerodrome

It is understood that a private aerodrome for the use of the King's aircraft is to be laid out in Windsor Great Park, which might indicate that His Majesty will not, after all, abandon the aeroplane for his personal transport.

The Heston Lorenz

Prevented by fog from getting in at Croydon a D.L.H. Junkers Ju. 52 went over to Heston last week and landed with the aid of the Lorenz blind landing system installed there. The Vickers Vellox of Imperial Airways (now with Perseus engines) has been making practice approaches with the equipment.

Hecks in Production

The first production model Parnall Heck three-seater with D.H. Gipsy Six engine should be flying any day now. Another model with a Wolseley Aries radial of 205/225 h.p. is not far behind.

FOKKER'S FASTEST FIGHTER. In *Flight* of January 9, 1936, an artist's conception of the Fokker D.21 single-seater fighter appeared. The machine made its first flight a few days ago in the hands of Mr. E. Meinecke. With the Bristol Mercury VI S of 605/645 h.p. about 250 m.p.h. is expected from the machine. The Hispano Y (860 h.p.) should improve this speed to nearly 280 m.p.h. The range, of course, will be much shorter.

HERE and THERE

A Carden-Baynes Two-seater

MR. L. E. BAYNES, who, it will be remembered, was responsible for the design of the Carden-Baynes auxiliary sailplane, is the moving spirit in a new company, Carden-Baynes Aircraft, Ltd., formed at Heston for the purpose of producing a new light two-seater.

Details of the machine are not yet available, but it is understood to be a high-wing side-by-side-seater, with the seats forward of the leading edge, and is designed to reap the fullest possible advantage from that excellent water-cooled four-cylinder unit, the 30 h.p. Carden, of the type used so successfully in Mr. S. V. Appleby's *Pou-du-Ciel*.

Cheapness of operation and modest first cost are primary features of the design, which is the subject of a number of patents.

Professor J. S. Haldane

FLIGHT regrets to record the death last week of Professor John Scott Haldane, whose researches into the effects of high altitudes on the human body have been of great value to mountaineers and airmen.

Three years ago, in collaboration with Sir Robert Davis, he produced a flying suit designed to enable the wearer to breathe and act normally at heights up to seventeen miles.

Perhaps, however, it is in the field of anti-poison-gas research that he gained his greatest fame, and his fine work in this connection during the Great War will long be remembered.

Seen Through a Glass . . .

A SERIES of attractive cocktail trays, specially designed for parties aeronautical, are being produced by Mr. Owen Jones, of 1, Talgarth Mansions, Barons Court, London, W.14.

Each tray is of glass framed in silver and blue, with chromium handles, and under the glass is a coloured illustration of any type of aircraft the purchaser desires.

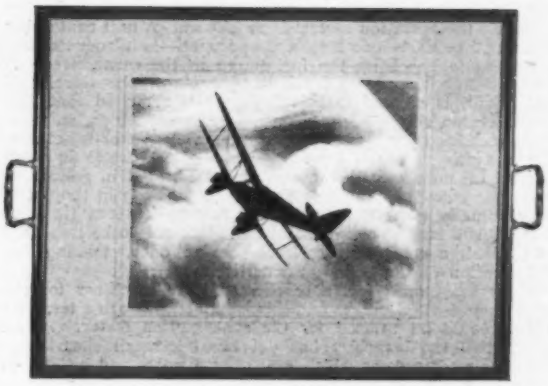
Flight is collaborating in the production of these trays by supplying the illustrations from its unique collection, which embraces the earliest aircraft produced in this country and extends up to the present day.

The picture measures 11⅛in. by 9½in., and the complete tray 19in. by 14¼in. Priced at 25s. 6d. each, these trays are excellent value, and for a slight extra charge the crest or other insignia of a squadron or club can be included.

The Lowe-Wylde Fund : More Contributions Required

LAST summer it was announced that a fund had been started to provide for the three orphan children of the late Mr. C. H. Lowe-Wylde (who was killed in 1933 while testing an ultra-light machine of a type which he pioneered). When the fund was inaugurated a total of £1,100 was aimed at, but to date, in spite of generous donations, contributions have totalled only £660, and the trustees are most anxious that the deficiency should be made up as soon as possible.

The trustees are Lord Sempill, A.F.C., F.R.Ae.S.; Kathleen, Countess of Drogheda, C.B.E.; and Air Commodore J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E. Donations should be sent to Mr. E. C. Gordon England, F.R.Ae.S., and cheques made payable to the Lowe-Wylde Memorial Fund.

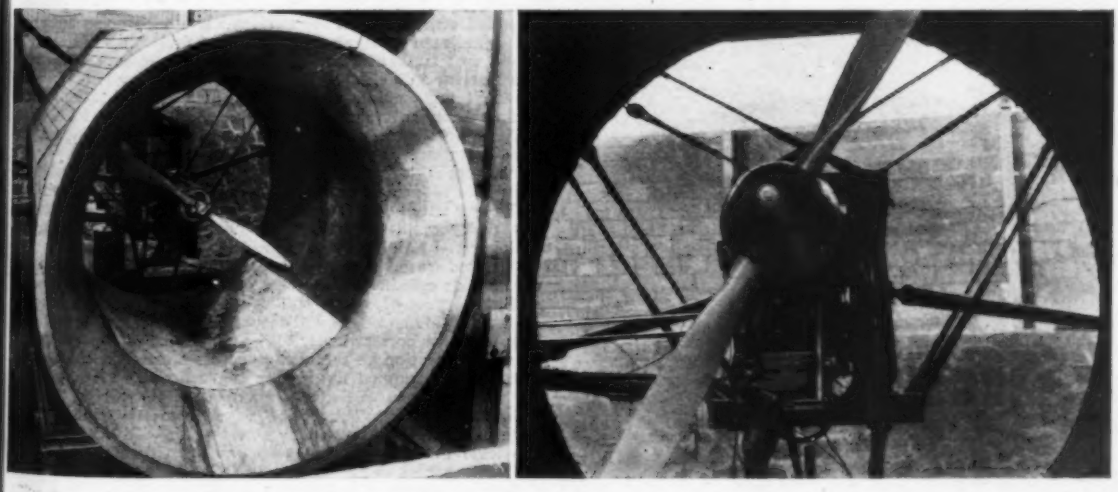


A typical example of one of the cocktail trays, framing a *Flight* photograph, referred to in the adjacent column.

Fuel Data at a Glance

THE Douglas D.C.2s intended for the Amsterdam-Batavia run are now being fitted with an ingenious piece of apparatus of British design and manufacture. A product of Short and Mason, Ltd., of Walthamstow, London, it takes the form of a fuel flowmeter combined with a depth gauge, which means that it registers the actual flow of fuel per hour and the quantity of fuel remaining in the tanks.

Through the employment of a fuel consumption meter it is possible to determine the power developed by the engines and to control their performance and fuel supply. The power developed cannot, of course, be read off on the r.p.m. indicator for the engine revolutions vary with speed, altitude and airscrew pitch setting. When a boost gauge reading is also taken



ENDURANCE : Two interesting views of De Havilland's venturi-type test bed with a new Series II Gipsy Six on test. In one will be noticed the neat spinner covering the D.H. V.P. airscrew hub. Two of these engines have been run as continuously as possible—receiving only routine attention (filters, clearances, etc.)—at full power (over 200 h.p.) and full revs (2,400). Towards the end of last week one had done 248 hours and the other 208 hours, both without trouble.

Here and There—

a fairly accurate figure for fuel consumption can be obtained, but this is not a direct measurement.

From the viewpoint of safety the consumption meter has obvious advantages betraying, as it does, vapour locks and partially opened valves.

Briefly the operation system is as follows. A unit containing two metal bellows—one large and one small—is introduced into the pressure line from the fuel pump to the carburetter. A pressure-drop, depending for its magnitude on the velocity of the liquid, is created in this unit. It is arranged that this pressure-drop shows itself as an over-pressure which, in turn, is compensated for by an air pressure. This latter is actually the measuring medium for the velocity of the petrol flow and is read off on a sensitive manometer calibrated in gallons or litres per hour. A relatively small pressure-drop in the petrol flow actually gives rise to an air pressure fourteen times as large. The makers claim that when the force to be measured is applied, a compensating force acts at once, making the deformation of the bellows a small one.

Compressed air is often carried on large machines for the operation of wheel brakes and this, supplied through a reducing valve, could be utilised for the consumption meter. As an alternative the company has developed a small electrically-driven air compressor which uses only 8 watts and weighs no more than 2lb. A pressure of about 15lb. is desirable.

A system of pressure transformation similar to that used for the consumption meter has been applied to a fuel quantity gauge. In this the pressure head of petrol acts as the indicating force of the instrument, the force applied being proportional to the height of the fluid level in the tank. The diaphragm system, accordingly, is on the bottom of the fuel tank. The pressure gauge has an empiric calculation in pounds, kilograms, gallons or litres.

The manufacturers are Short and Mason, Ltd., Aneroid Works, Walthamstow, London, E.17.

A Remarkable Plastic

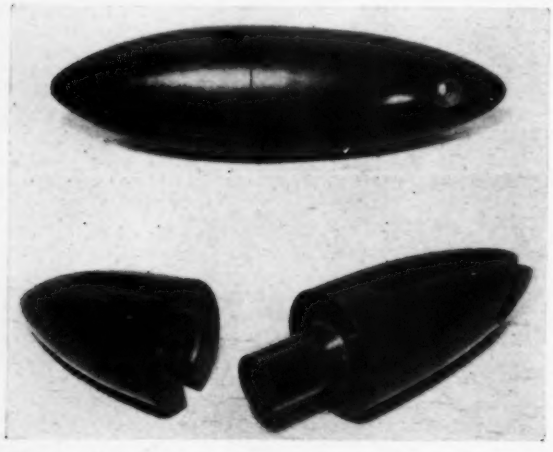
THE truly amazing physical qualities of modern plastic materials are well illustrated in "Tufnol," which is now being extensively used in aircraft work.

A homogenous electrical insulating material, "Tufnol" is described by its makers—Ellison Insulations, Ltd., Perry Barr, Birmingham, 20—as being half the weight of aluminium but equal in tensile strength.

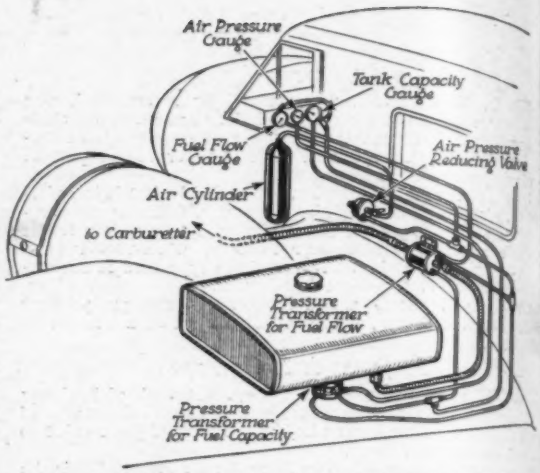
By way of example of its uses in aircraft construction may be mentioned "acorns" for bracing-wire intersections (it is being used for this purpose on the Heyford), control cable pulleys, fair leads, aerial lead-in tubes, radio components, certain retractable undercarriage parts, cam heels for distributors, and electrical insulation generally.

It is stated to be unaffected by climatic conditions and does not expand or contract under conditions of heat or cold. It is non-hygroscopic, and is not affected by fumes. Most mild acids and alkalis do not attack it, and its hardness and bitter resinous taste make it immune from the attacks of ants and rodents. It will not corrode and will not splinter under severe bumps or strain. Neither will it support a flame.

"Tufnol" is used in many industries for the manufacture of quiet and resilient gear pinions, and for many other purposes—even for nuts and bolts, which fact gives some indication of its tensile strength.



Bracing-wire acorns made of "Tufnol," some of the remarkable qualities of which are referred to above.



A hypothetical layout of the Short and Mason fuel indication system described in the adjacent column.

The petrol pump valves of the D.H. Comets, incidentally, were made of "Tufnol." Such valves are stated to be unaffected by oil or fuel, by age, or by temperatures up to 212 deg. F. They do not swell or warp and are quiet in operation, light in weight, and durable.

"Tufnol" can be sawn, planed, punched, drilled, tapped, screwed and otherwise machined with ordinary tools, or during manufacture it can be moulded into almost any shape. It is produced by Ellison Insulations, Ltd., in eight different brands with distinctive properties, and is available in sheet, rod, tube, strip or special sections, or in any special moulding required.

An Easy-maintenance Aircraft Battery

SOME very practical and interesting features distinguish a new type of Dagenite accumulator, designated the 6-DAII-B and intended for non-aerobatic civil aircraft.

Briefly, the outstanding points include a patented topping-up device to prevent over-filling and spilling of the electrolyte; accessibility for topping-up without disturbing the accumulator or removing its cover; and robust terminal connections arranged at one end of the battery and designed to accommodate sweated-in heavy-gauge cables.

The topping-up device is so ingenious that it merits description in full. In a tube screwed and "cemented" into the threaded centre boss of each cell lid is a tube accommodating the spindle of a level indicator or float. This float has a sealed air chamber at its base, and its spindle is provided with two circular guide collars and a valve-like top, which, when the float and spindle are in the fully "up" position, abuts against a similarly shaped seating at the top of the tube. The float, of low specific gravity, moves freely up and down the tube according to the height of the electrolyte.

The topping-up tubes, closed by knurled caps, are made long enough to protrude through the cover, which fits over the whole of the accumulator. Topping-up is therefore carried out without the necessity of either removing the battery cover or undoing the holding-down gear.

Distilled water is poured into each tube until the white top of the float spindle rises and cuts off any further supply, when a slight excess of water builds up in the cup-shaped top of the tube; this is a clear indication that the cell is full of electrolyte to the correct level. When the knurled cap is replaced a small projection on the inside depresses the float slightly and releases any trapped liquid into the cell.

Any water inadvertently poured on to the top of the tube after the float has "shut off" runs down the outside of the tube into the wells formed by recessing the cell lids well below the level of the container walls and partitions. These wells hold any excess liquid until it is dispersed by evaporation.

This accumulator is made in the 12-volt type, with a capacity of 26 amp. hrs. at a 20-hour rate of discharge. The weight is 34lb., including acid, and the price £6 15s. 6d.

The makers are Peto and Radford, 50, Grosvenor Gardens, London, S.W.1.

TWO BRITISH NEWCOMERS

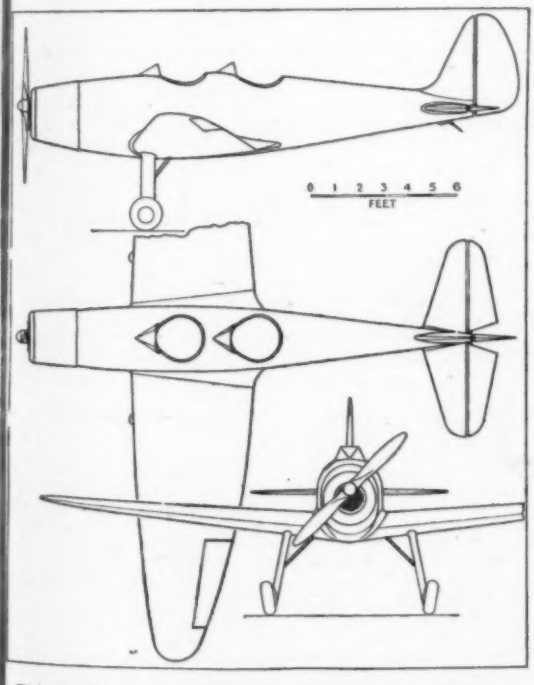
Monoplane Trainer and Fast Transport Monoplane: Interesting Designs by C.L.W. Company at Gravesend

FROM Gravesend Airport comes news of a new British make of aeroplane, to be produced in contrasting types. The constructors are the C.L.W. Aviation Co., Ltd. (well known in connection with the C.L.W. patented wing), the directors of which are Messrs. S. Wilding-Cole, O.B.E., W. P. Mackinson, A. Levell, F. S. Welman, and Sqn. Ldr. F. W. H. Lerwill, O.B.E.

The first two machines are a two-seater low-wing trainer—of a type which should be particularly suitable for instruction preparatory to flying modern high-performance military and other machines—and a twin-engined transport monoplane. The former will be the first to appear (the transport will be built only to order), and, all being well, it should be flying next month.

Sqn. Ldr. Lerwill, lately retired from the R.A.F., has had extensive experience in the training of Service personnel which has proved greatly advantageous in the planning of the T.1, as the new two-seater is known.

The projected C.L.W. twin-engined transport, with two Siddeley Cheetahs.



The attractive layout of the forthcoming C.L.W. trainer is apparent from these general arrangement drawings.

Both the cantilever wing and the fuselage are of quite unusual interest. The former is of the patent C.L.W. type, which is said to possess abnormal qualities of lightness and simplicity and, at the same time, to be very stiff in torsion. Broadly speaking, this type of wing, which tapers both in plain form and thickness and has a single main spar, consists of an open box-like structure, the front and rear members being inter-connected and affixed to the spar with cantilever ribs. Diagonal cross-bracing is provided on both upper and lower surfaces. As originally planned, a straight centre-section was to have been embodied, but the prototype machine will have a dihedral angle which originates on the centre line on the under surface of the fuselage. The covering of the main wing panels is of fabric. Split trailing-edge flaps extend from aileron to aileron.

Stressed-Skin Fuselage

The fuselage, a stressed-skin monocoque structure with Alclad covering, is of commendably simple and apparently sturdy design, with the tail plane, elevator, rudder and fin all readily detachable. Of wide track and relatively high to minimise danger of damage to wing tips, the undercarriage is in two separate halves. Sqn. Ldr. Lerwill does not recommend the fitting of brakes for early training.

Normally the machine will be fitted with either the D.H. Gipsy Major of 130 h.p. or the new 90/95 h.p. Pobjoy Niagara III radial. The latter installation will include the newest type of deep chord hinged cowling without the customary Pobjoy "helmets." Petrol feed is by dual engine pumps.

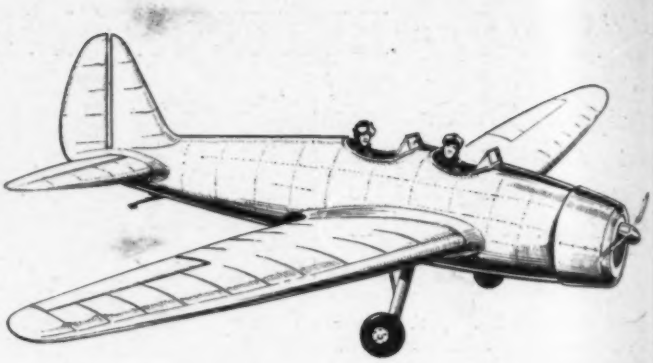
It is the contention of the manufacturers that it is advisable to put the pupil in the front cockpit, as this more closely simulates conditions in normal Service machines to which he will graduate. The rear cockpit is of sufficient diameter to permit the installation of any normal gun ring. When provision is made for gunnery training and similar duties the Gipsy Major engine is recommended, due to its greater power.

It is expected that with the Pobjoy the maximum speed will be in the neighbourhood of 135 m.p.h., and with the Gipsy Major about 150 m.p.h.

The Transport Monoplane

Due mainly to the incorporation of the C.L.W. type wings, the twin-engined transport monoplane is designed to carry a proportionately heavy payload, and as a result of good aerodynamic design should have a high cruising speed.

In general layout it is a twin-engined cantilever monoplane. Its tapered wings, which are of duralumin tubes and channels, have a centre section parallel in chord. Unlike the outer panels, which are fabric-covered, this section is covered with dural sheet and is filleted into the fuselage. The main spar is continuous through the fuselage, and torsional loads are taken by continuous tubes.



An artist's conception of the little Pobjoy-engined C.L.W. trainer now "on the stocks."

The fuselage, a dural monocoque structure, has frames of lipped channel section with stringers of angle section, and is covered with flush-riveted dural sheet.

The tail plane is built integral with the fuselage; the elevators and rudder have servo flaps for trimming; and control surfaces have fabric covering with leading edges and fillets of dural. Not only the main undercarriage but the tail wheel is completely retractable, the former into the engine nacelles.

Well forward in the nose is the pilot's cockpit, with windscreen of Triplex and top and sides of Rhodoid. The main seven-passenger cabin is entered from a door on the port side, and is 12ft. 0in. long, 5ft. 11in. high, and has an average width of 4ft. 4in. Behind this is a lavatory of 45 cu. ft. capacity. Yet further aft is the luggage compartment (capacity 34 cu. ft.).

Originally the C.A.1 was designed to take the 270 h.p. Siddeley Cheetah V radial of 270 h.p., and with two of these units the estimated speed at sea level is 209 m.p.h. With the 290/320 h.p. moderately-supercharged Cheetah IX, the maximum speed at altitude should be considerably increased. The unsupercharged engines should give a cruising speed of 203 m.p.h.

The main dimensions are: Span, 52ft.; length, 32ft. 3in.; height, 10ft. 0in. The tare weight is 3,152 lb., and fully loaded the machine weighs 6,100 lb., or 6,400 lb. in "overload" condition. The wing loading is 21.3 lb./sq. ft.

A HISTORICAL SUMMARY

IT was surprising to see the number of members of the Royal United Service Institution who assembled on Tuesday (an unusual day for a lecture) of last week to hear Sir Francis Shelmerdine read a paper on the "Development of Civil Aviation." Though the subject had nothing to do with the fighting services, it is evidently one in which the members of the Institution take a keen interest, and on which they are anxious for the latest information. Lord Swinton took the chair, but was obliged to leave before the end of the paper to attend to his other duties.

The Director of Civil Aviation read a paper which recounted and summarised the developments in civil and commercial flying during the past four years. He dealt with the difficulties which confront the operators of internal air lines, and admitted that he was afraid all except a few of them were losing money. The choice of unsuitable routes was mainly the cause of failure. The average journey speed on our internal air services was 43 m.p.h. If the forty-five minutes now taken in driving from Victoria to Croydon could be reduced to fifteen minutes, it would be equivalent to increasing the cruising speed of aircraft on the London-Paris route from 160 to 260 m.p.h.

As regards external air services from this country, Sir Francis gave a useful, and, in fact, masterly summary of the developments of the last four years, and of the plans for the future. It is not necessary to repeat the details here as they have all been chronicled in *Flight*, but they were evidently of great interest to the audience, and it was certainly impressive to hear all the happenings and plans thus collected into one paper. One interesting comparison may be instanced. Last year Pan American Airways carried nearly twice as many passengers as did Imperial Airways, but the latter carried nearly three times as many tons of air mail in and out of this country compared with Pan American Airways' operations in and out of the United States.

Sir Francis mentioned that travel by air to Capetown is at a speed of nearly 40 m.p.h. as compared with 19 m.p.h. by boat, and the extra cost is about £5 10s. per day saved. From London to Singapore the air journey averages over 40 m.p.h. and the boat about 13 m.p.h., while the extra cost is about £3 15s. for each day saved. For the Atlantic crossing three types of aircraft were being developed, the Short flying boat, the Mayo composite aircraft, and high-speed landplanes, of which two were on order, which would be capable of operating the service during the summer and possibly even during the winter. Sir Francis said that he had not even a drawing of these landplanes to show his audience.

The discussion which followed showed the interest taken by the audience, and also suggested the desirability of constantly repeating to the public what is taking place in the aeronautical world.

Hungarian Holiday

ALL private owners should make a note of the fact that the Third Magyar Pilota Picnic (Hungarian Pilots Picnic) will be held in Hungary this year from June 13 to 19.

As its name implies, this event does not entail strenuous or competitive flying, and the sole object of the organisers is to ensure that participants shall have an interesting and enjoyable holiday. Further details will be published in due course.

Royal Aero Club A.G.M.

THE annual general meeting of the Royal Aero Club will be held at the club premises, 119, Piccadilly, London, W.1, next Wednesday, March 25, at 6.30 p.m.

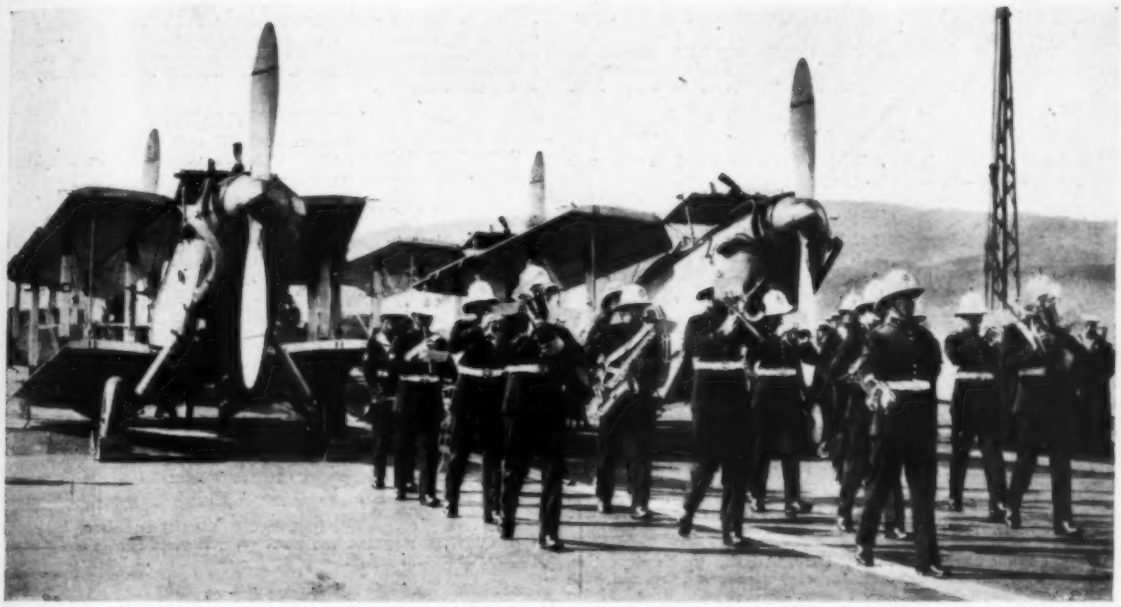
The agenda is as follows: (1) Chairman's report. (2) To elect president and vice-presidents. (3) To elect committee.

The following are recommended by the committee for the presidency and vice-presidencies: President, the Duke of Atholl, K.T., G.C.V.O., C.B., D.S.O.; vice-presidents, the Duke of Sutherland, K.T.; the Marquess of Londonderry, K.G., M.V.O.; Viscount Wakefield of Hythe, C.B.E., LL.D.; Lord Gorell, C.B.E., M.C.; Lt.-Col. M. O'Gorman, C.B.

The following nine members have been nominated to the nine vacancies on the committee: Major C. J. W. Darwin, D.S.O.; W. Lindsay Everard, M.P.; Major A. Goodfellow; A. C. S. Irwin; the Marquess of Londonderry, K.G., M.V.O.; Major R. H. Mayo, O.B.E.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Lieut.-Col. M. O'Gorman, C.B.; Major H. A. Petre, D.S.O., M.C.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS



NOT A STRANGE STREET PROCESSION, as a first glance suggests, but a Royal Marines band playing during inspection on the aircraft carrier *Furious*. The machines are Fairey III Fs.

CONVERSION OF CADRE SQUADRONS INTO A.A.F. SQUADRONS

The following cadre (Special Reserve) squadrons will be converted into squadrons of the Auxiliary Air Force in the near future. The county associations which will be responsible for the administration of the squadrons after their conversion, are being expanded into Territorial Army and Air Force Associations; their addresses will be as stated below:—

No. 500 (County of Kent) (Bomber) Squadron, Manston.

The Territorial Army and Air Force Association for the County of Kent, Union Street, Maidstone.

No. 501 (City of Bristol) (Bomber) Squadron, Filton.

The Territorial Army and Air Force Association for the County of Gloucester, 17, Whiteladies Road, Bristol.

No. 503 (County of Lincoln) (Bomber) Squadron, Waddington

The Territorial Army and Air Force Association for the County of Lincoln, The Old Barracks, Buxton Road, Lincoln.

No. 504 (County of Nottingham) (Bomber) Squadron, Hucknall

The Territorial Army and Air Force Association for the County of Nottingham, Derby Road, Nottingham.

The four squadrons, and Filton, Waddington and Hucknall stations, will be transferred within the command of the A.O.C.-in-C., Air Defence of Great Britain, to No. 1 Air Defence Group on March 16, 1936, for the conversion to be carried out. The dates of conversion of the squadrons into Auxiliary Air Force units will be announced later.

FLYING ACCIDENT

The Air Ministry regrets to announce that F/O. Robert Legg and F/O. Peter Godfrey lost their lives in an accident which occurred at Atleyhill, Yorkshire, on March 9, to an aircraft of No. 26 (Army Co-operation) Squadron. F/O. Legg was the pilot, and F/O. Godfrey was the passenger.

R.A.F. BENEVOLENT FUND

The usual meeting of the grants committee was held at Iddesleigh House on Monday, March 9. Mr. W. S. Field was in the chair, and the other members present were: Air Comdre. B. C. H. Drew, C.M.G., C.B.E., Group Capt. C. H. K. Edmonds, D.S.O., O.B.E., Air Vice-Marshal C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C. The committee made grants to the amount of £214 12s. 9d. The next meeting was fixed for Monday, March 23.

The first Council meeting of the year 1936 was held at the Offices of the Fund, Iddesleigh House, Caxton Street, London, on Wednesday, March 11. The Viscount Wakefield of Hythe, Chairman, opened the meeting with a reference to the death of His Majesty King George. Lord Wakefield then referred to the death of Earl Beatty, who had for so long been a Vice-President of the Royal Air Force Benevolent Fund, and a letter of sympathy was sent to the Viscount Borodale. After welcoming Air Vice-Marshal Sir Philip Game on his return as a Member of Council, and Mr. Walter Field after his serious illness, the Council proceeded to consider the accounts and report for the year 1935.

The Hon. Treasurer, Mr. Walter Field, reported that gross expenditure upon relief including Vanbrugh Castle School totalled £18,786 from all branches of the Fund. This is the largest amount so far spent on relief in one year and exceeds 1934 by £2,596. Applications totalled 1,962, representing an increase of ninety-nine over the year 1934.

The Hon. Treasurer remarked that at the beginning of 1934 it was estimated the General Fund should be prepared for an expenditure of about £18,000 per annum for the next few years, that the Council had recognised the dependence of income on displays and had decided that assured income should be increased by £6,000 per annum. He pointed out that in 1935 expenditure from the General Fund alone reached £19,243 and with the expansion of the Air Force there appears to be every reason to expect that this figure will be exceeded later. The dependence of the Fund upon Service displays and Empire Air Day was again emphasised by the fact that without them in 1935, income would have fallen short of requirements by £5,967.

ROYAL AIR FORCE GAZETTE

London Gazette, March 10, 1936.

General Duties Branch

The following are granted short service commissions as Pilot Officers for five years on the active list with effect from and with seniority of February 21:—F. W. Flood, G. E. Horne, H. D. Newman, J. B. Pascoe-Webb, V. Ray, G. H. Sheehan, E. A. Whiteley, N. W. Wright.

Pilot Officer on probation W. I. Hammond is confirmed in rank (January 16); F/O. W. F. Pharazyn is promoted to the rank of Flight Lieutenant (January 28).

The following Pilot Officers are promoted to the rank of Flying Officer:—P. S. Gomez (Seniority June 19, 1933) (October 17, 1934); R. G. R. Buckley (March 29, 1935); W. G. Bannister (Seniority November 28, 1934) (June 30, 1935); P. E. Hadow (Seniority November 28, 1934) (August 1, 1935); E. A. Howell (Seniority November 28, 1934) (August 28, 1935); D. Saward (January 28); E. M. Withy (March 6).

Sqn. Ldr. W. F. Dickson, D.S.O., O.B.E., A.F.C., is granted the acting rank of Wing Commander (unpaid) with effect from March 2 while appointed to the directing staff of the Royal Air Force Staff College.

Medical Branch

Flt. Lt. G. S. Strachan, M.B., Ch.B., is promoted to the rank of Squadron Leader (March 1).

Memorandum

The permission granted to Lt. W. B. T. Ross to retain his rank is withdrawn on his enlistment into the Army (Supplementary Reserve) (February 12).

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

Sqn. Ldr. J. Everidge, M.C. (R.A.F. Retired), is granted a commission as Flight Lieutenant (Hon. Squadron Leader) in Class C (January 20); Flt. Lt. B. D. S. Tuke (R.A.F. Retired), is granted a commission as Flight Lieutenant in Class C (December 1, 1935); Flt. Lt. H. G. P. Ovenden (R.A.F. Retired), is granted a commission as Flight Lieutenant in Class C (January 6); Flt. Lt. E. Drudge, M.B.E. (R.A.F. Retired), is granted a commission as Flight Lieutenant in Class C (January 16); A. J. P. Groom is granted a commission as Flight Lieutenant in Class C (January 6); J. S. Holloway is granted a commission as Flight Lieutenant in Class C (January 28); F/O. T. W. Ashton is transferred from Class A to Class C (March 4); F/O. K. C. Cooke is transferred from Class AA(ii) to Class C (December 1, 1935); F/O. L. H. Mason is transferred from Class C to Class A (November 27, 1935); F/O. L. M. Timmins relinquishes his commission on completion of service and is permitted to retain his rank (January 19); F/O. I. R. Parker relinquishes his commission on appointment to a commission in the Auxiliary Air Force (February 10).

SPECIAL RESERVE

General Duties Branch

F/O. C. D. Griffiths relinquishes his commission on completion of service (September 29, 1935).

AUXILIARY AIR FORCE

General Duties Branch

No. 610 (COUNTY OF CHESHIRE) (BOMBER) SQUADRON.—I. R. Parker is granted a commission as Squadron Leader and appointed to the command of the squadron (February 10).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captains.—C. H. Elliott-Smith, A.F.C., to No. 9 Flying Training School, Thornaby; to command, 2.3.36. L. T. N. Gould, M.C., to Headquarters, Coastal Area, Lee-on-the-Solent; on appointment as Senior Equipment Staff Officer vice Group Capt. J. B. Graham, M.C., A.F.C., 2.3.36. J. B. Graham, M.C., A.F.C., to School of Naval Co-operation, Lee-on-the-Solent; to command vice Group Capt. L. T. N. Gould, M.C., 2.3.36.

Wing Commanders.—A. P. V. Daly, A.F.C., to Headquarters, Coastal Area, Lee-on-the-Solent; for duty as Senior Personnel Staff Officer vice Group Capt. L. F. Forbes, M.C., 2.3.36. J. A. Sadler, to Home Aircraft Depot, Henlow; for Administrative duties, 2.3.36.

Squadron Leader.—G. V. Howard, D.F.C., to No. 111 (F) Squadron, Northolt; to command, 2.3.36. H. H. Down, A.F.C., to No. 25 (F) Squadron, Hawkinge; to command vice Sqn. Ldr. W. F. Dickson, D.S.O., O.B.E., A.F.C., 2.3.36. D. D'A. A. Greig, D.F.C., A.F.C., to No. 9 Flying Training School, Thornaby, for duty as Chief Flying Instructor, 2.3.36. B. K. D. Robertson, A.F.C., to Armament Training Camp, Leuchars; for flying duties, 3.3.36. C. Chapman, D.S.C., to Electrical and Wireless School, Cranwell; for Administrative duties vice Sqn. Ldr. W. E. Purdin, 2.3.36. F. A. Norton, to Headquarters, Air Defence of Great Britain, Uxbridge; for duty as Officer-in-Charge, Display Training Camp, Hendon, 5.3.36. A. L. Paxton, D.F.C., to Central Flying School, Upavon; for duty as Chief Flying Instructor vice Sqn. Ldr. H. H. Down, A.F.C., 1.2.36.

Flight Lieutenants.—R. C. Jonas, to No. 9 Flying Training School, Thornaby, 2.3.36. R. Menzies, to R.A.F. Station, Mildenhall, 1.2.36. J. A. S. Outhwaite, to No. 23 Group Headquarters, Grantham, 3.3.36. E. R. Simonds, to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 5.3.36. R. Chadwick, to No. 48 (G.R.) Squadron, Manston, 2.3.36. R. A. R. Mangles, to No. 9 Flying Training School, Thornaby, 2.3.36. C. R. Smythe, to No. 9 Flying Training School, Thornaby, 2.3.36. R. C. Field, to R.A.F. Station, Kai Tak, Hong Kong, 21.2.36. M. S. Keogh, A.M., to R.A.F. Station, Singapore, 21.2.36. H. E. King, to No. 36 (T.B.) Squadron, Singapore, 21.2.36.

Flying Officers.—E. V. Knowles, to Armament Training Camp, Aldergrove, 2.3.36. J. G. Macintyre, to No. 504 (Co. of Nottingham) (B) Squadron, Hucknall, 1.3.36. E. D. Joyce, to No. 1 Flying Training School, Leuchars; on appointment to a temporary commission on being seconded from the Army, 20.3.36.

Pilot Officers.—J. H. Slater, to Headquarters, Central Area, Abingdon, 2.3.36. A. J. Whillier, to No. 810 (F.T.B.) Squadron, 1.3.36. W. A. A. de Freitas, to No. 810 (F.T.B.) Squadron, 1.3.36. K. N. M. Eyres, C. E. E. Florigny, R. M. Longmore, J. D Melvin, W. M. Norman, A. W. D. Miller, and P. W. Townsend, to No. 36 (B.T.) Squadron, Singapore, 21.2.36. G. F. Chater, G. I. Pawson, J. Pilling, and E. W. Thornewell, to No. 100 (T.B.) Squadron, Singapore, 21.2.36. W. P. Whitworth, to No. 7 (B) Squadron, Worthy Down, 2.3.36. G. W. Peel, to No. 16 (Army Co-operation) Squadron, Old Sarum, 2.3.36. A. R. Fane de Salis and T. N. K. Walker, to No. 19 (F) Squadron, Duxford, 2.3.36. B. J. R. Roberts, to No. 26 (Army Co-operation) Squadron, Catterick, 2.3.36. L. D. Dadswell, to No. 32 (F) Squadron, Biggin Hill, 2.3.36. J. R. A. Embling, to No. 91 (B) Squadron, Upper Heyford, 2.3.36. J. B. Pascoe-Webb, to No. 19 (F) Squadron, Duxford, 6.3.36. F. W. Flood, to No. 32 (F) Squadron, Biggin Hill, 6.3.36. N. W. Wright, to No. 40 (B) Squadron, Abingdon, 6.3.36. G. H. Sheehan, to No. 49 (B) Squadron, Bircham Newton, 6.3.36. G. E. Horne, to No. 56 (F) Squadron, North Weald, 6.3.36. V. Ray, to No. 104 (B) Squadron, Abingdon, 6.3.36. H. D. Newman and E. A. Whiteley, to School of Air Navigation, Manston, 6.3.36.

Stores Branch

Flight Lieutenant.—C. M. P. Hartley, to No. 3 Flying Training School, Grantham, 28.1.36. D. W. Dean, to R.A.F. Station, Mildenhall, 1.2.36. L. J. V. Bates, to D. of E., Dept. of A.M.S.O., Air Ministry, 2.3.36.

Accountant Branch

Squadron Leader.—A. C. Lobley, to No. 5 Flying Training School, Sealand; for Accountant duties vice Wing Comdr. T. C. Miller, M.C., 5.3.36.

Flight Lieutenants.—D. Sender, to R.A.F. Station, Mildenhall, 1.2.36. R. D. Pratt, to No. 2 Flying Training School, Digby, 29.2.36.

Medical Branch

Squadron Leaders.—V. S. Ewing, to No. 9 Flying Training School, Thornaby; for duty as Medical Officer, 2.3.36. A. W. Corner, to R.A.F. Depot, Uxbridge; for duty as Medical Officer, 3.3.36.

Flight Lieutenants.—J. A. Kersey, to Princess Mary's R.A.F. Hospital, Halton, 2.3.36. W. G. S. Roberts, to R.A.F. General Hospital, Hinaidi, Iraq, 1.3.36.

Flying Officers.—D. S. M. MacArthur, to No. 10 Flying Training School, Tern Hill, 4.3.36. C. F. R. Briggs, to Home Aircraft Depot, Henlow, 9.3.36. L. M. Crooks, to Princess Mary's R.A.F. Hospital, Halton, 9.3.36. D. J. Sheehan, to Central Flying School, Upavon, 9.3.36. H. D. Conway, to No. 1 Flying Training School, Leuchars, 9.3.36. W. J. Fowler, to No. 2 Flying Training School, Digby, 9.3.36. R. F. Wynroe, to No. 5 Flying Training School, Sealand, 9.3.36. E. B. Harvey, to No. 7 Flying Training School, Peterborough, 9.3.36. I. K. Mackenzie, to No. 9 Flying Training School, Thornaby, 9.3.36.

Dental Branch

Flying Officers.—R. M. Brown, to Headquarters, R.A.F., Cranwell, 9.3.36. W. E. Nelson, to Air Armament School, Eastchurch, 9.3.36.

Chaplains Branch

Revd. J. H. W. Haswell, to Headquarters, R.A.F., Halton; for duty as Chaplain (Methodist) on appointment to a short service Commission, 27.2.36.

TO AMERICA *via* the ARCTIC

Possibilities of the Northern Route for Air Line Operation : Comparatively Short "Hops" : London to New York in 36 Hours ?

By JOHN GRIERSON

HAVING been laughed at ever since I returned from Canada in 1934 for wasting (*a*) my time and (*b*) my money in flying over the icy deserts of the Arctic, I now find some consolation in Pan American's proposals for Arctic Air Route test flights. Had this enterprising firm been British, the consolation would have been greater, but in air transport one must adopt an international outlook, even if it means that others may develop an Empire airway.

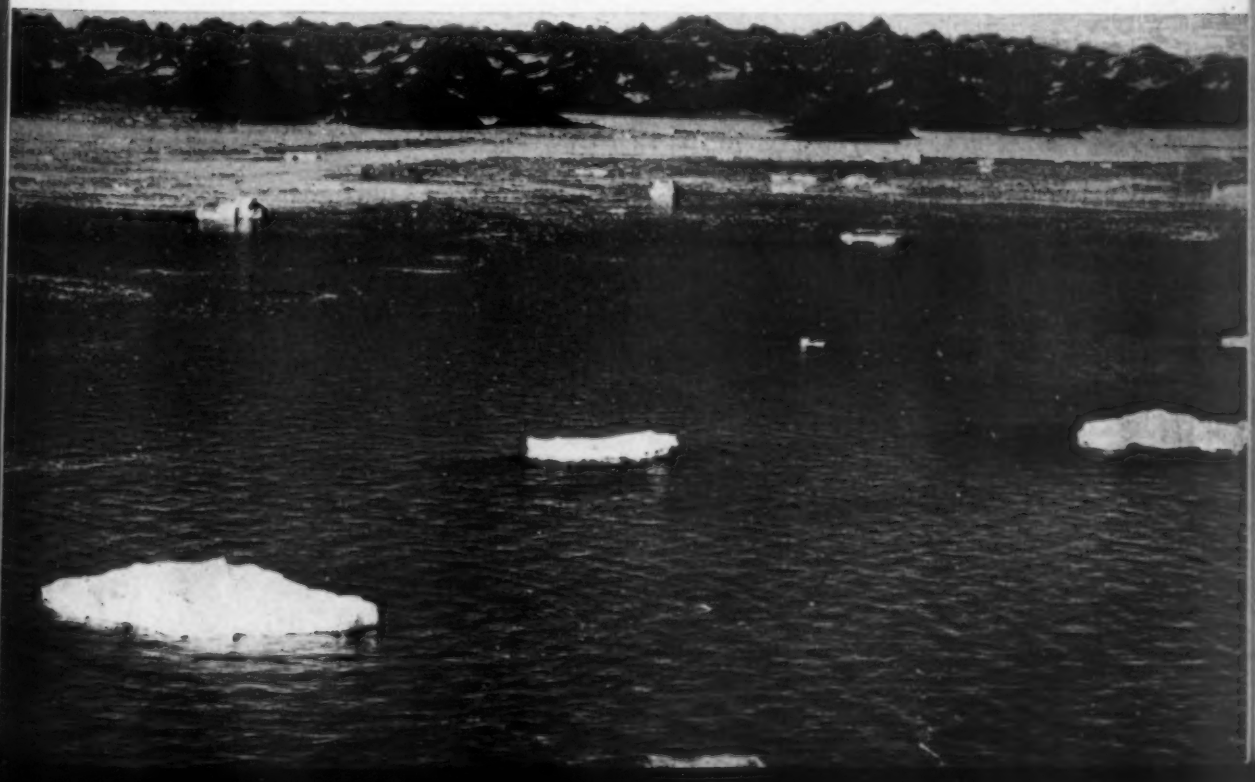
The reason why I flew across Greenland was because I believed that a transatlantic route, using Nature's stepping-stones to keep the stages down to about 600 miles, should have a great future. And my experiences, despite the considerable handicaps of handling a seaplane solo and of being backed by insufficient funds, have strengthened my initial belief. There are no insuperable obstacles.

The route which I suggest, allowing the stages to reach a maximum of 700 miles, in view of recent progress in flying-boat design, would be as follows:—

	Statute miles approx.
London (Rochester)—Scalloway (Shetlands) ..	600
Scalloway—Reykjavik (Iceland)	700
(Emergency harbours at Thorshavn, Faroes, 225 miles, and at Hornafjord, Iceland, 525 miles.)	
Reykjavik—Angmagssalik (Greenland)	480
Angmagssalik—Godthaab (Greenland)	430
Godthaab—Wakeham Bay (Hudson Strait) ..	685
Wakeham Bay—Povungnetuk (Hudson Bay) ..	225
Povungnetuk—Eastmain (Hudson Bay)	530
Eastmain—Ottawa	500
Ottawa—New York	340
Total	4,490 miles.

The author at Ottawa during his flight ; with him is Wing Cdr. Godfrey, C/O of the Royal Canadian Air Force at Ottawa. (Below) A photograph taken by Mr. Grierson of the coastal mountains of East Greenland, with icebergs floating in the sea.

Pan-American Airways, in conjunction with Danish Air Lines, are to make test flights this summer over the Greenland route between New York and Copenhagen. Mr. John Grierson, who flew a fox Moth seaplane solo along this line in 1934, describes the route's potentialities in this article, specially written for "Flight."



Mr. Grierson's Fox Moth leaving Angmagssalik, followed by a fleet of Eskimo kayaks. This snapshot was taken by Capt. Mikkelsen from the supply ship which visits the settlement once a year.

At Povnugnetuk there should be a branch line to serve Central Canada, just as the Shetlands would act as the terminus for North Europe, thus:—

	Miles.
Povnugnetuk—Port Nelson (Hudson Bay) ..	550
Port Nelson—Winnipeg	525
Total from London	4,185

The advantages of such a route may be summarised in the following manner: First, instead of the range of 3,200 miles at 160 m.p.h. which the direct Ireland-Newfoundland route requires, 1,200 miles would be ample for these easy stages. As a result, this reduction of 2,000 miles in range would allow an increased payload of, roughly, 700 per cent. to be carried on the Arctic Air Route.

Secondly, since the line taken by the Arctic Air Route almost coincides with the Great Circle course between London and Winnipeg, it would shorten the air mileage to Central Canada as compared with other transatlantic services.

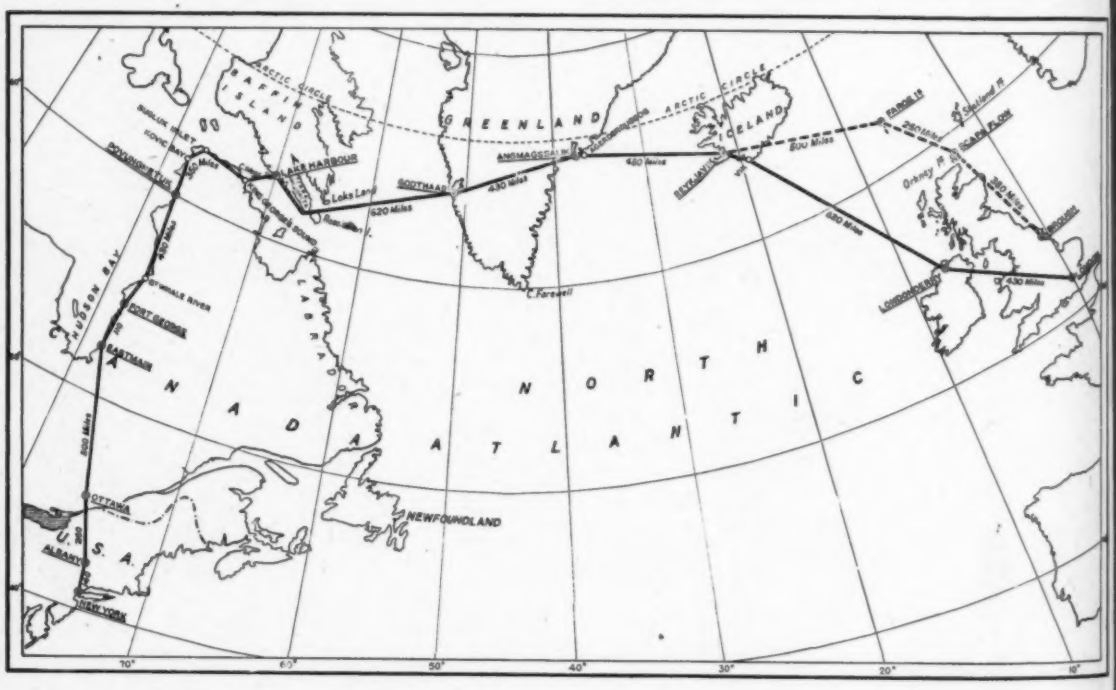
Thirdly, the comfort of passengers would be increased by the shortened periods of flight. Whilst designers may be able to produce flying-boats capable of staying aloft for twenty- or twenty-five-hour stretches, no means has yet been found of increasing the air endurance of human beings. In fact, it has already been noticed that even on the short hops generally employed in European transport, passengers do sometimes feel very much the worse for wear, whilst the present tendency to increase operating altitudes places a greater strain upon the human breathing apparatus.

Fourthly, it is obviously easier to forecast weather for 600 miles of sea than for 2,000 miles of ocean. There is also the advantage that, since the longest stretches would take only four to five hours flying, the chance of serious weather changes occurring during flight would be considerably lessened. Thus, on the consideration of safety, the Arctic Air Route scores.

Healthy Arctic Atmosphere

Fifthly, we must not forget the overwhelming beauty of the barren rocks and the wastes of snow and ice in Greenland. Not only would this provide a thrilling sight for passengers, in contrast to the monotony of sitting over the endless ocean on the direct route, but it would reveal a latent value which has only recently been suggested. I refer to the Arctic as a health resort and summer "winter sports" centre. It is well known that many types of disease bacteria common to us cannot exist in those latitudes, and well-informed scientists, such as Professor Debenham, believe that the curative properties of the Arctic will prove exceptional. At Julianehaab, Greenland, the conditions are very favourable for ski-ing, and for the sportsman there are hitherto unfished rivers and fiords alive with salmon.

The fulfilment of this fifth advantage depends very



The Arctic route as flown by Mr. Grierson. The distances shown are between the towns underlined. The dotted route shows his first attempt, which finished at Reykjavik with a broken undercarriage.

Another port of call on the Arctic route—Lake Harbour, Terra Incognita.
(Photograph by permission of the Governor and Committee of the Hudsons Bay Coy.)

much on the attitude of the Danes, who own Greenland and administer it solely for the benefit of the Eskimos. At present it is a closed country, but it is probable that Denmark would be prepared to open up certain districts, provided the immunity of the Eskimo colonies could be guaranteed.

Having said so much in favour of the Arctic Air Route, one may now examine its disadvantages and the reasons why there has been so much lethargy over the development of such a promising route. I strongly suspect that this is a case of men preferring the Devil they know to any other. As a seafaring nation we have a vast fund of experience in the vagaries of the North Atlantic at the lower latitudes, compared with which our knowledge of the Arctic Regions scarcely extends beyond the rough maps and notes jotted down by a handful of explorers. In fact, when I began to make plans for flying across Greenland there were only three main sources available: the report of the British Arctic Air Route Expedition, which had carried out a valuable survey in the Angmagssalik district; Comdr. Wolfgang von Gronau, who was the first man to fly across the Ice Cap; and Sqr. Ldr. Lawrence, of the Royal Canadian Air Force, who had been flying for a whole winter in the north of the Hudson Bay. Despite the unstinted help obtained from all these quarters, I found that there was a very great deal left to the imagination. For instance, nobody seemed quite certain how low a temperature I should have to cater for, whether radio medium waves could be made to work over the Ice Cap, and what was the earliest date at which the ice-freeness of the east coast of Greenland would coincide with that of the Hudson Bay area.

Weather Conditions

My worst fears were concerned with the weather, both in the air and on the ground. Ice-forming conditions and the possibility of prolonged blind flying would have proved tremendous obstacles to me, though they would have meant nothing to a multi-engined flying boat equipped with de-icers and automatic pilot. Also, there was the risk of a gale sinking my Fox Moth at its moorings. Yet in practice the worst weather of the whole flight occurred in the Irish Sea during the stage from Rochester to Londonderry! Arctic weather seems to alternate between extremes: if the visibility is less than sixty miles it is "bad," since one can normally see from 150 to 300 miles. Even in really bad weather the coasts of Iceland and Greenland have an unexpected advantage, due to local variations. For instance, the British Arctic Air Route Expedition discovered that although a gale blew at one point on the east coast of Greenland, thirty miles away it was calm. Therefore, by providing alternate lake bases fifty miles apart, we should be able to direct air traffic to the one having fine weather at the time of flight. Winter operation would add the problem of taking-off from water in a machine which could also operate on ice, and until a solution were found the air line could operate only for six months. There is little doubt, however, that the requisite aircraft would be developed once the need became apparent.

I was also anxious about navigation difficulties: inaccurate maps, lack of landmarks or colonies easily distinguished from above, and the behaviour of my magnetic compass within 800 miles of the Magnetic Pole. Indeed, the maps (scale 60 to 100 miles per inch) were bad and the colonies often could not be distinguished against the background of rock from 4,000ft., but the compass worked surprisingly well, even under conditions of more than 50° variation. With radio beacons, an air line should experience no difficulty.

The thought of how my untrained ground assistants at the various outlandish harbours might behave gave me many sleepless nights before the flight began. A motor boat, carelessly handled, can convert a perfectly serviceable seaplane into driftwood, whilst even a rowing boat can inflict a severe wound on the floats, wings, or fuselage. Yet, in practice, it was only a Londonderry boatman who made two attempts to sink me at my moorings, once by entangling my mooring-line in his rudder, allowing the swift current of the Foyle to do the rest, and the second time by hanging on to my grass-line as I was beginning to taxi away. True, an Eskimo did bring his kayak up under the fuselage just after I had filled the rear tank to overflowing, and began to light his pipe; but, by the way he smiled when he paddled off, I am sure he did not *mean* to do any harm.

Perhaps the greatest strain of all was caused by the absence of wireless stations at any of my ports of call in the Hudson Bay. Not once, but four times, I took off when, so far as one could see, favourable conditions prevailed; and every time I encountered fog or sea mist at one point in the journey, so that I was left sitting above it and wondering whether it would clear before I was due over my destination. Had there been any form of wireless communication with the ground, this strain would never have been imposed. Needless to say, such a deficiency would have to be made good before there is any attempt to run an air line, and I have heard that the Hudson's Bay Company intends to install small transmitters at their principal posts.

The foremost requirement for any air line over Greenland is ground equipment. Radio beacons, meteorological services and harbour organisation must first be completed, and the introduction of reliable maps must be expedited. Any attempt to run without these facilities is doomed to failure, and one is inclined to believe that Pan American will have established, at any rate, a temporary network of wireless stations before they go ahead with their extensive programme of ten return test flights this year. Once the ground organisation has been completed the effect of adverse weather will have been reduced almost to the level of European airways. In fact, there is no reason why the Arctic Air Route should not be operated in the very near future, first as a six-month service, and later perennially. It would constitute the vital link in communications between the Old World and the New, enabling passengers to reach Winnipeg or New York within 36 hours of their departure from London, with greater comfort and safety than could be offered by any other heavier-than-air transatlantic service.

Private Flying

Topics of the Day

Complications . . .

ONLY a week ago a pilot with a not unreasonable amount of light aeroplane experience was complaining that aeroplanes were becoming too complicated. Why, he said, did the designers add fearful contraptions like air brakes or flaps and retractable landing gear or even one new and relatively unnecessary instrument? He, personally, had quite enough to look after in the old-fashioned light aeroplane.

The facts he overlooked were that the "complications" did not really complicate so much as simplify flying and that every mechanical contrivance gradually grows more refinements as the years go on. Compare cars to-day with the cars of the early (but not too early) days? Even the bicycle has grown an additional brake, a free-wheel and a multi-speed hub since the safety machine was first produced. No doubt the hard-boiled riders of the penny-farthing viewed the first chain-driven safety bicycle with considerable misgiving.

I am all in favour of additional devices if these add to the safety or ultimate simplicity of the flying business. One lever more or less makes precious little difference once a pilot's initial conservatism has been overruled. And the drivers of the most up-to-date vehicle in the world, the flying machine, are often positive Colonel Blimps among the diehards.

Introduce one new lever or one new instrument, and the bars echo with the criticisms of the childlike veterans. How often have transport pilots raised their eyebrows in horror after listening to my far-from-concise explanation of the Lorenz approach system? "When," they say so often, "I can see a picture of the airport on my dashboard—then will I fly in conditions of zero visibility."

. . . and Comparisons

EVEN if we agree that there are a number of levers to move and dials to watch, can we honestly say that even a modern luxury aeroplane is more complicated than a car? Yet half-wits, even in modern road conditions, rarely move the wrong lever and can teach themselves to make that most complicated hand and foot movement—the double de-clutch action—while wriggling between rows of fast-moving cars.

Disregarding the instruments, my own car, which is not very modern, has ten different controls, three of which are used only at the start of a journey. On a modern light aeroplane which I was flying recently I also counted ten controls, but of these only five are used in normal flight It requires less mental effort to "place" the tail-trimming lever, for instance, than to remember the gear positions with a strange car.

Bigger Fry

ON one occasion I spent three hours in the control cabin of a really up-to-date transport aeroplane which was fitted with every aeronautical gadget known to man—from flap gear to fuel dumping valves. During the first half-hour I was staggered by the array of devices, yet at the end of three hours I could remember the position of every lever or instrument and knew that, apart, perhaps, from the take-off and landing, I could have flown the machine to its destination without making any mistakes.

I originally learnt on an aeroplane with a stick, a rudder bar, a throttle, and a tail-trimming lever which I never used. A year or two later I graduated to an aeroplane with four or five more controls, looked fearfully round the cockpit, took off, and discovered that it was very easy after all. One of the "controls" was a seat-raising lever. I applied the brakes with it once and once only. Two years later I felt a seat projection instead of the brake lever on another aeroplane and "took off" with the brakes hard on—luckily without trouble. Since then I have usually opened up with the stick back—just in case there is some obstruction in front of the wheels.

Of course, it makes a great deal of difference how the controls are placed, and some approach to standardisation would tend to make things easier.

Using Them

ALL these devices, of course, should be used. One lesson which I have learnt (I hope) from odd hours in the second pilots' seats of really big machines is to fly as far as possible on the trimming gear. Why should one hold a load on the stick when a perfectly good trimming wheel or lever has been bought and, presumably, paid for? The landing is so very much easier if the fore-and-aft trim has been set to a nice, smooth hands-off glide.

Some people tend to use their air brakes or flaps as a last-minute substitute for the perennial side-slip. That system, though not without its merits, does not allow one to use the brakes as a rumbling device, and it is very pleasant to think that one has the ability to stretch the glide if necessary.

I never believe that my engine will pick up at once, since on two occasions it has made a laughing sound and momentarily died on me. The psycho-analysts will have no difficulty in explaining a love of efficient flappery and a tendency to over- rather than to under-shoot.

Motor-conscious transport pilots of clean aeroplanes—with a pronounced sink at low gliding speeds—always give me a nasty ten seconds as they lift their machines off the tree-tops with a subtle throttle-hand on the way into an airport.

INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

CASTLE BROMWICH

DURING the week ending March 13 flying times were 16 hr. 10 min. dual and 13 hr. 55 min. solo. New members include Messrs. S. T. Holland and E. O. Stich (ordinary) and R. Whitworth and J. R. Jackson (flying).

LONDON

Flying time for last week, during which Mr. C. W. Taylor went solo, was 71 hr. 20 min. Miss F. A. Gallop and Messrs. A. R. Weyl and J. A. Gallop have become members.

LEEMING

The plans for York municipal aerodrome having been approved by the Air Ministry building operations commenced last week. Yorkshire Aviation Services hope to start flying during April. Flying times from the beginning of the month to March 14 totalled 26 hr. 5 min. Mr. Barwick and Mr. Shand completed their "A" licence tests. Messrs. Greenwood, Sheldrake and White became pupils.

BORDER

Carlisle aerodrome is being drained and levelled and all pilots using it should exercise care. The new B.A. Eagle was collected from Hanworth recently and the journey north was made in 3 hr. 10 min. in face of a 30-35 m.p.h. head wind all the way. Mr. Robert Kronfeld has visited Carlisle with his B.A.C. Super Drone and several members flew the machine. The following have become members: Messrs. C. F. Mason, J. A. Jenson and G. F. Stuart.

READING

The morning of last Tuesday week was a great day at Reading for it saw the return of Tommy Rose to Woodley. He was greeted by the Mayor of Reading, Mr. and Mrs. Powis, Mr. and Mrs. Miles, and several Town Councillors. His record-breaking Falcon Six is now on view in Reading for a payment of 6d. in aid of the local hospital. The Reserve Training School has been flying hard all the week and a number of new Hawk Trainers have been added to the fleet.

BROOKLANDS

With a change in the weather club flying is getting back to normal. New members last week were Mr. Harvey, Mr. Len Clemens from Sweden, and Mr. Motion, for a course of instrument flying. Mr. Steve (Shell) Melstrom completed the tests for his "A" licence, while Mr. Hepburn essayed his first solo flight. Four of the pupils under instruction for their "B" licences are taking the next examination for their second-class navigator's certificate. Messrs. Rowland Morris and Henry Vallance, who already have their "Bs," have accepted positions as instructors and air line pilots with Aberdeen Airways.

Arrangements have been made for an early morning flight to Shoreham next Sunday. Messrs. Seth-Smith and Castlemaine, of General Aircraft, brought the Jubilee Monospar to Brooklands and a number of members went up. Two important dates are, April 18, when the first annual four-club (Brooklands, Cinque Ports, Northampton, South Coast and Royal Engineers) dinner will be held at the Park Lane Hotel, and June 20, when the Brooklands garden party will be held.

LIVERPOOL

In face of misty weather the Liverpool and District Aero Club flew 41 hr. 5 min. during the week ending March 12.

REDHILL

Blind-flying certificates have been issued to Messrs. C. G. K. Browne and C. B. Field. Last week's flying was 65 hr. 15 min.

YORKSHIRE

Club machines flew 11 hr. 45 min. last week and Mr. W. Bayley (Aviation Group member) went solo. Mr. J. C. Atkinson (an Air League "Young Pilot") has commenced his flying training at Yeadon.

C.A.S.C.

Ten members attended at Cambridge last Sunday and flew 6 hr. 5 min. An additional 3 hr. 35 min. was put in by Messrs. Dew and Mascell, who took off from Penshurst for Cambridge but were forced through bad visibility to put in at Gravesend. They later returned to Penshurst.

CAMBRIDGE

Last week was a record one for this time of the year, the flying returns showing just over eight-five hours. Messrs. Stone, Druce and Dick have completed their "A" licence tests and three more members should complete theirs by next week. The Monospar made a charter trip to Cheltenham.

PORTSMOUTH

The Portsmouth Aero Club hopes to start night flying toward the end of next week, when the Gipsy I Moth, which is being specially equipped, will be ready. The charge for night flying has been fixed at £4 per hour dual or solo. The total flying time for the week ending March 14 was 27 hr. 20 min.

HANWORTH

The total of last week's flying times was 45 hr. 20 min. Messrs. L. Castlemaine, A. P. E. Callier and A. Lawton went solo and Messrs. H. McLelland and F. Turvil passed the tests for their "A" licences. Mr. J. A. M. Henderson is housing his Hornet Moth in the Club hangar and Commander Dove's Drone is also at Hanworth.

SOUTH COAST

Over twenty hours were flown by members last week. Mr. Aitchison passed the tests for his "A" licence and Miss Grant went solo. The monthly landing competition was won by Mr. Head. A "Pou" has arrived at the aerodrome, but has not yet been flown. The Aeronca will be demonstrated next Sunday. New members are Lady Scott, Miss Barton and Mr. Thompson.

TOLLERTON

Flying time at Tollerton last week was twenty-seven hours. Flt. Lt. Bennett and Mr. J. H. Ward joined the Club as flying members, and Messrs. C. L. Westley and C. L. Bennett as associate members. Mr. G. W. Marshall has qualified for his "A" licence and Mr. K. Bee has gone solo. On Saturday, March 7, members flew to Meir aerodrome for the opening of the new clubhouse.

A PHŒNIX FOR AUSTRALIA: Mr. C. J. Melrose with the Heston Phœnix which he is shortly flying out to Australia in easy stages. This machine is the first of the production batch and incorporates certain improvements, mainly an even better view than before from the pilot's seat and a somewhat neater Dowty retractable undercarriage. Mr. Melrose hopes to carry a few expense-sharing passengers. (*Flight* photograph.)

Private Flying

NORFOLK AND NORWICH

In spite of the chief instructor's indisposition last week, the Club maintained the previous week's good flying time. Three lectures were given in the district by different members. On Sunday evening talks were given to members by Lord Walpole and F/O. M. Bircham.

BENGAL

Club machines flew 83 hr. 30 min. during January. Mr. F. Gloeckle and Mr. S. P. Ray passed their "A" licence tests and Mr. K. M. Raha requalified as an "A" licence pilot. On February 2 the Club celebrated the seventh anniversary of its inauguration. H.E. the Governor of Bengal was present and witnessed aerobatics, crazy flying and various competitions.

CINQUE PORTS

Miss Jeanne de Casalis has completed the tests for her "A" licence and Mr. Campbell has gone solo. Mr. and Mrs. Cliff have gone to Manchester to compete in the British Skating Championship. The Tiger Moth, which is now so much in demand for advanced training, has been fitted with full blind-flying instruments in the front cockpit in addition to those in the rear. This machine will in future be used for blind-flying training to assist "B" licence candidates who have to fly Tigers on the Hendon test. "OG"

will now be kept almost exclusively for night flying. A metal Moth will soon be added to the Club's fleet. Mr. Grubb has been at Lympne with his Aeronca, in which a number of members have flown. Mrs. E. P. Pugh has become a member.

RAND

A new branch of the Rand Flying Club, whose headquarters are at the Rand Airport, Germiston, was opened at Benoni on Saturday, February 22. Flt. Lt. "Tommy" Rose demonstrated the record-breaking Falcon, and a creditable selection of British and American machines, including one of the new Hawker Hartebeestes, was present.

HERTS AND ESSEX

For the fortnight ending March 12 the flying time was 135 hr. 24 min. Mr. G. H. Goodman went solo, and Miss A. J. Prowse, Miss Stuckey and Messrs. Vigers, Peacock, Bekey and Pask became members. One hundred hours solo was completed by Mr. McLeod; Mr. Marten accomplished his night flight; and Messrs. Larsen and Marten completed their blind-flying tests. An Aeronca gave a second demonstration last Sunday. Mr. Don Poole has purchased a Comper Swift G-ABUS. The competition for the Alexander Clark Challenge Casket will be held on March 22.

A Monoplane Wing Lecture

TO-NIGHT'S lecture of the R.Ae.S. Students' Section is entitled "The Monoplane Solution," and will be delivered by Mr. R. C. Abel, A.R.Ae.S.I., with Capt. J. Laurence Pritchard in the chair.

Some striking claims for a new form of wing construction are likely to be made by the lecturer, and, by special permission of the Air Ministry, some interesting data relating to tests of the wing at Farnborough will be given.

The organisers hope that everyone with experience of monoplane wing construction or who is working on any special design at the moment will attend to express their views on the subject.

On Tuesday, March 31, Mr. K. G. Seth-Smith is to lecture on "The Test Pilot's Job."

All Students' Section lectures are held at 7 p.m. in the R.Ae.S. Library, 7, Albemarle Street, London, W.1.

Isle of Man Air Races

TWO open handicap races for both British and foreign pilots and aircraft are to be flown during May and June. The first, on Saturday, May 30, will be from Hanworth to the Isle of Man. There will be turning points at Hooton, Blackpool, St. Bees Head and Maughold Head, and the finish will be over a line in Douglas Bay, the machines eventually landing at Ronaldsway aerodrome. A compulsory stop will be made either at Hooton or Blackpool. The prize money is divided as follows: first, £100; second, £70; third, £30.

The second race will be on Monday, June 1, and will take the form of a three-lap contest round the Isle of Man. Left-hand circuits will be made, the start and finish being Ronaldsway aerodrome. The turning points are: Ronaldsway, Douglas Bay, Maughold Head, Bride, Peel and Tynwald Hill, and the prizes are: £50 £35, £25 and £10 for the first four home. In addition to the cash prizes each competitor will receive a souvenir of the races. The entrance fee is £2 for each race, and it is compulsory that each competitor be covered for third-party risks. Messrs. Dancy and Rowarth will undertake the handicapping.

The races are being promoted by the Corporation of Douglas and will be conducted under the regulations of the F.A.I. and competition rules of the Royal Aero Club. All communications regarding entries, etc., should be addressed to Capt. R. H. Stocken, M.I.Ae.E., at 18-20, Regent Street, London, S.W.1 (Telephone: Whitehall 8863).

Around Europe

MR. R. V. L'ESTRANGE MALONE, Airwork's European sales manager, departed from Heston last Monday on the Continental demonstration tour already announced. He is first to visit the Rhineland, staying at Aachen, and afterwards Belgium, France, Spain, Portugal, Switzerland, Eastern Europe and Scandinavia.

Saharan Touring

TO those who contemplate touring in the less frequented—or even the more frequented—parts of the globe, the Shell company has always been an ever-present help.

The Asiatic Petroleum Company has now published an up-to-date edition of the *Guide du Tourisme Automobile et Aérien au Sahara*. All the aerodromes and landing grounds are sketched and described, and at the end of the book there is a map of this forbidding region. For those who *must* cross the Sahara the *Guide* will be invaluable.

Capt. Keep Home from Australia

HIS many friends will be interested to learn that Capt. A. S. Keep returned last Thursday from a visit to Australia where, we gather, he saw much of interest to British aircraft firms. Capt. Keep informs *Flight* that he has not yet made any plans for the immediate future, but with his long experience of aircraft production it may be assumed that it will not be long before his services are brought back into the industry.

Forthcoming Events

Mar. 19. R.Ae.S. (Coventry Section) Lecture: "Type-Testing of Aircraft," by Flt. Lt. Bulman, 8 p.m., Armstrong Siddeley Canteen.
Mar. 19. R.Ae.S. Students' Section Lecture: "The Monoplane Solution," by R. C. Abel, 7 p.m., R.Ae.S. Library.
Mar. 20-22. Reunion of Halton Belgium Tour parties, High Leigh, Hoddesdon, Herts.
Mar. 23. R.Ae.S. Lecture: "Welding," by R. H. Dobson Institution of Electrical Engineers, 6.30 p.m.
Mar. 26-29. Yorkshire Gliding Club: Members' Meeting.
Mar. 31. R.Ae.S. Students' Section Lecture: "The Test Pilot's Job," by K. G. Seth-Smith, 7 p.m., R.Ae.S. Library.
April 13. Aero-8 Club: Easter *Pou-du-Ciel* Rally, Canute Air Park, Essex.
April 16 R.Ae.S. (Coventry Section) Lecture: "Aircraft Instruments," by Mr. J. E. Chorlton, 8 p.m., Armstrong Siddeley Canteen.
April 17. Norfolk and Norwich Aero Club: Annual Dinner and Dance.
April 18. Brooklands Flying Club: Four-club Dinner at the Park Lane Hotel.
April 20. R.Ae.S. Lecture: "New Light on Strength of Materials Afforded by Modern Physics," by Dr. H. J. Gough, Institution of Electrical Engineers, 6.30 p.m.
April 24. Bristol and Wessex Aeroplane Club: Annual Ball.
April 28. R.Ae.S. Students' Section Lecture: "Application of Aerodynamics to Mechanical Engineering," by J. L. B. Jones, 7 p.m., R.Ae.S. Library.
May 2-3. *Pou-du-Ciel* Rally, Broadway, Worcestershire.
May 10. R.Ae.S. Garden Party, Great West Aerodrome, Harmondsworth.
May 15-18. Yorkshire Gliding Club: Open Meeting and Competitions.
May 15-June 1. Stockholm Aero Show.
May 23. Empire Air Day.
May 27-June 4. Austrian Aero Club: Whitsun Tour.
June 6. R.A.F. Flying Club: Annual Display.
June 6-14. Czechoslovakia Aero Club: Tour.
June 20. Brooklands Flying Club: "At Home."
June 27. Royal Air Force Display, Hendon.
July 10 and 11. King's Cup Race.
July 18. Portsmouth Aero Club: Isle of Wight Race.
August 1-2. Yorkshire Gliding Club: Open Meeting.
August 15-30. Yorkshire Gliding Club: Open Meeting and Competitions.
September 5-6. Aero Club of Hungary: Week-end Aerien.
Nov. 13-29. Fifteenth International Aero Exhibition, Paris.

AN AMATEUR'S "TWINITIATION"

Flying a "Little Air Liner": The New D.H. Dragonfly from the Point of View of a Single-engine Pilot

By "INDICATOR"

DURING the past year or two I have become more and more convinced that private ownership amongst the more wealthy citizens would become universal just as soon as the right kind of aeroplane was produced. One or two manufacturers have made a genuine attempt to attract the type of owner who is really going to matter in the future, and the latest addition to the small but growing range of suitable types is the D.H.90, or Dragonfly.

The big market is open and has been open for a number of years, but even the most optimistic of persons could hardly expect the serious business man to take kindly to the small open machine or even to the small single-engined cabin machine. Not only does he expect to go where he wants to, wet or fine, but he also expects to travel in comfort and in absolute safety with his family or his friends. Two engines are a *sine qua non*, as well as long range, roominess and provision for the installation of such equipment as two-way radio.

This type of owner would probably engage a professional pilot-cum-radio operator, and the flying characteristics of the machine might not, within reason, interest him greatly. Nevertheless, it is unlikely that he would be entirely without natural curiosity and would probably feel the desire to take over during long flights. Dual control, therefore, is another essential.

At the other end of the scale is the enthusiastic owner or would-be owner to whom the greatest interest is, or will be, in the work of piloting and navigating. Even a yacht is not much fun if a professional skipper is in permanent command. It is for this type of owner that I am speaking, and, as a single-engined light aeroplane pilot of no startling experience or skill, I can say right away that the Dragonfly would present no difficulties to any pilot with more than fifty or a hundred hours' solo flying to his credit.

Manœuvrability and stability are most happily blended in the Dragonfly. (*Flight* photograph.)

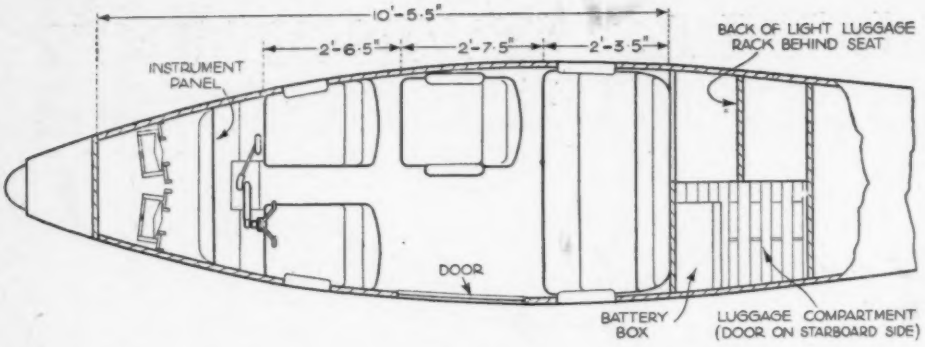
Unnecessary Trepidation

In common with the majority of club-trained amateurs, I have always looked upon the medium-sized or large multi-engined machine as something rather terrifying and possessed of quaint and uncontrollable characteristics. On the various occasions when I have been left in control of devices known, euphemistically enough, to readers of the lay press as "giant air liners," I have treated them with respect and have handed over with a sigh of relief before the approach and landing. Placed precariously some yards ahead of the wings, one feels that neither a take-off nor a landing can be carried out by normal methods, and I have only comforted myself with the thought that other people manage to conduct these vessels with reasonable accuracy.

When, therefore, Mr. Buckingham, the D.H. demonstration pilot, courageously vacated the seat of the mighty in my favour, I played nervously with the various handles of the "90" before summoning courage and pushing forward the throttles. Beyond the expected facts—a natural swing must be corrected, and, since the rudder is not directly in a slipstream, the pedals must be used with alacrity and generosity—there was nothing to trouble anyone possessed of normal common sense. When pulled off she stayed off and continued on her way at a considerable angle and with a steadily gathering speed.

At once it was apparent that we of the light aeroplane movement have never understood the meaning of the words "forward view," nor have we realised the mentally cramping effect of cramped surroundings. As for flying, the Dragonfly did it for herself. Within four minutes of taking over for the first time I was pushing happily through a cloud layer with eyes glued, quite unnecessarily, on the standardised Sperry equipment.

Once above the clouds and after playing at turns for a few minutes, we—that is, Mr. Buckingham, myself and another member of the staff of *Flight*—played musical chairs. In other words, we climbed about the aeroplane while trying different seats. With the possible exception of two or three well-known transport aeroplanes, the "90"



A diagrammatic view of the Dragonfly's cabin layout, which is extraordinarily spacious. Any of the passengers and/or pilots can change seats in the air without the slightest difficulty. In addition to the main windows, small windows at the rear give the back-seat passengers a view downwards without neck-craning.

is the quietest machine in which I have ever flown and we conversed without a trace of that conscious raising of the voice which is usually necessary. The view even from the rear seat is good, and there is a solidity about the furnishings and furbishings which should satisfy the least air-minded of citizens. The importance of this point cannot be over-stressed. After all, the Dragonfly makes a really admirable charter machine and many taxi passengers may be having their first experience of air travel therein.

My first approach was a frank and unvarnished failure, but, since I knew it from the very moment of closing the throttles, it could hardly be considered to be an approach within the meaning of the word. The fact was that a long, gentle turn had placed the machine thoroughly badly in relation to the Hatfield boundary, and the attempt was used for a little experiment in sideslipping. The Dragonfly slips like a Moth—and there is no need to say more.

On a second attempt I throttled back with the full realisation that 130 m.p.h. takes a little losing with a clean aeroplane, adjusted the trim, pulled up the nose until the speed had dropped below 90 m.p.h., applied the flaps and turned towards Hatfield. We crossed the boundary at 90 m.p.h. (20 m.p.h. too fast—I was busied by the round dozen Tigers and things cavorting in the air and on the ground) yet our run had finished long before the circle was reached. This first landing was a trifle "wheely," since I was not at all sure of the height of the undercarriage, but there were none of the difficulties I had expected. I simply felt the machine on to the ground. My second landing was a full three-pointer and I knew that with another half-hour's practice the Dragonfly would be entirely "mine."

The flaps-down gliding angle of the "90" is comparable with that of the Hornet with the air brakes "on," so that there is little chance of overshooting badly and yet no difficulty such as can be experienced with a very pronounced change of attitude during the landing process. At the same time the flaps are effective enough as brakes to allow the pilot to push the nose down, in order to steepen the approach, without gathering speed too rapidly. Although the trimming gear is of the sometimes-maligned spring-loaded elevator type, the spring mechanism is so arranged that the mechanical load is not apparent on the control when this is eased back for the hold-off and landing. In other words, one *feels* the air flow when it is most important that one should do.

One little difficulty experienced is worth mentioning simply because the sequence of events shows the Dragonfly again in a foolproof light. On my second take-off the machine swung so badly that I had to throttle back and start again. Another attempt ended in the same way, despite the application of more starboard throttle and full left rudder. I was beginning to feel foolish and felt relieved when Mr. Buckingham suffered the same fate. The starboard brake was temporarily binding, and the point is, that, with no experience of the machine, I still did not get into trouble and instinctively throttled back when the swing started to develop.

Finally, it may be remarked that the Dragonfly shows no tendency to drop a wing. A full stall, engines on or off, and flaps up or down, terminates in the gentlest fall of the nose on a perfectly level keel.

DE HAVILLAND DRAGONFLY
Two 130 h.p. Gipsy Majors

Weight (including standard equipment)	2,500 lb.
Disposable load	1,500 lb
Length overall	31ft. 8in.
Span	43ft. 0in.
Height	9ft. 2in.
Maximum speed	144–147 m.p.h.
Cruising speed at 1,000ft. and 2,100 r.p.m.	127–130 m.p.h.
Range (with 85 gallons)	885 miles
Take-off run in 5 m.p.h. wind	265–325 yds.
Climb to 5,000 ft.	7.5 min.
Service ceiling	15,700 ft.
Ceiling on one engine and full load	2,100 ft.
Gliding angle (flaps down)	1 in 8
Price	£2,650.

FLYING BY THE BOOK

Manual of Air Navigation; Volume I (H.M. Stationery Offices. 6s. net).

WHATEVER may have been said or thought at one time or another about State-operated concerns, the publications of the Stationery Office have always been extraordinarily good value for money.

This manual covers every possible aspect of air navigation from map or chart reading, the triangle of velocities and dead reckoning to radio direction-finding—though here it is not, perhaps, quite as up to date or complete as it might be. Nevertheless, the book deals with navigation rather than with radio problems, and the comparatively small amount of attention paid to direction-finding is amply balanced by the quantity of space devoted to the subjects of meteorology and compass errors, which are, all too often, passed over by writers on aviation subjects.

Although the *Manual of Air Navigation* is primarily intended for Service consumption, very little of the information contained therein has not the fullest possible application to civil flying also.

"Learning to Fly," by Frank A. Swoffer, M.B.E. (Sir Isaac Pitman and Sons. 7s. 6d.).

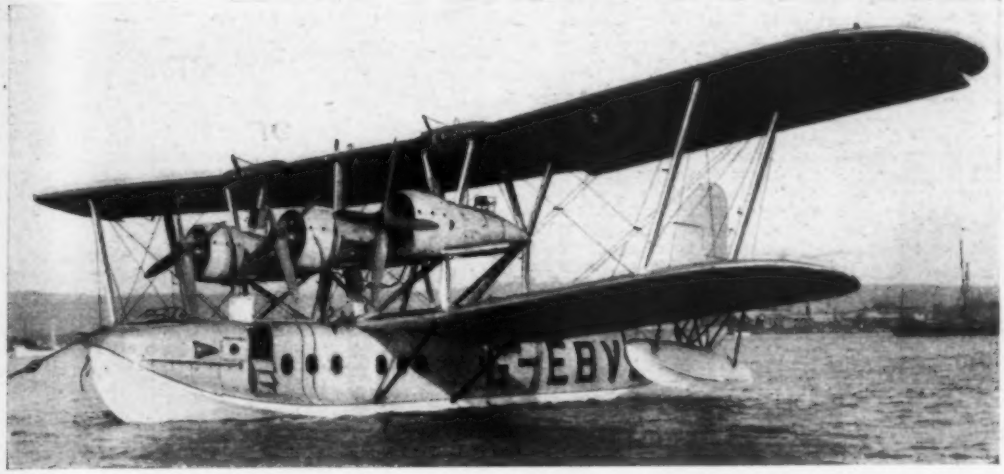
ORIGINALLY published in 1929, Mr. Swoffer's little book on flying training has possibly been better known and more widely read than any. As the author remarks in his preface, the methods of flying instruction have been little changed since *Learning to Fly* was first published; it would be peculiar if they had. Certain portions have, however, been brought up to date and a chapter on aerobatics has been added.

It is difficult for anyone who is not an ardent "about-to-be" to judge the true value of a book on flying instruction. Nevertheless, in reading it, we discovered that quite a number of the explanations of control effects, for instance, were partially new to us, and, consequently, interesting. Every manœuvre is described in the greatest detail.

Only one criticism can reasonably be levelled against any feature. The sketches are, perhaps, just a little *too* naïve at times, though the pupil who has seen a little silhouette of a machine on its back ("position nine") may be less likely to make a tail-high take-off!

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



BORN 1928 . . . : Given a new lease of life with three Siddeley "Tiger VI" engines this eight-year-old Calcutta will be used for flying-boat training by Imperial pilots at Hamble.

THE WEEK AT CROYDON

Unhinged : A Disguised Civilian : Imperial Ice Prevention : Two-handed Baggage : Things to Go

EXCITEMENT—paralleled only by the K.L.M. mail bag which dropped on or near some sacred golf green some time ago—was caused by what was reported as a door falling from Imperial Airways' *Boadicea* last week.

Judging from the fuss, one would have thought it was one of those foot-thick dungeon doors bound with steel bands and studded with iron bolts. Not a bit—it was the small, light, three-ply cover of an emergency exit which descended like a bit of floating paper, and hit the ground with such tremendous force that it wasn't even scratched! It fell in the Purley tram depot, which is understood to be bearing up well, though suffering from slight shock.

Much interest was caused here recently by the appearance of a military Rapide, which seemed as quaint to the commercial community as the sight of one of their pals about the place dressed up as a Territorial officer in full marching order. Incidentally, the multiplicity of gas masks, tin hats, whistles, revolvers, haversacks, belts, straps, and bits of odd leather and webbing with which an officer and gentleman is bedizened on such occasions affords an interesting parallel to the Christmas-tree appearance of the R.A.F. Rapide compared with his civilian brother.

The Olley Air Service people remain darkly mysterious about the fact, patent to every eye, that they have acquired the luxuriously fitted Rapide, G-ACTT, lately the property of H.M. the King. One imagines that this means that His Majesty will be replacing this machine.

Last Friday the D.H.86, *Dryad*, was delivered to Imperial Airways fitted with Dunlop Anticers, and duly made her maiden trip to Brussels on the same day. Superstitious people may be glad to know that bad luck was encountered—no ice formation was available to try out the system.

One of the biggest loads of solid gold ever carried in a single aeroplane—something like three tons—left Croydon for Holland last week in a fully loaded K.L.M. F.22. Passengers sometimes grumble at the excess baggage restrictions, and it is therefore interesting to note that it has been agreed by the International Air Traffic Association that "hand baggage" (for which no charge is made) will in future cover handbags (ladies'), coats, umbrellas, walking sticks, cameras, and attaché-cases, containing only business documents, weighing less than 11 lb. Cases have occurred in the past of passengers insisting that a large suitcase, under which they positively staggered, was hand luggage because they were (just) carrying it in both hands.

The Irish Service

Olley Air Service have made an important survey flight from Croydon, *via* Bristol, to Dublin and then from Dublin to the Isle of Man with a number of people interested in the Dublin-Bristol-London line, which will be opened by O.A.S. this year with connections, *via* Belfast and the Isle of Man, to Liverpool, where the K.L.M./B.C.A. line to Holland and Scandinavia will form a link. The machine, a Rapide, was flown by Capt. Olley, and the guests were Mr. Flynn, of the I.F.S. Department of Industry and Commerce, Mr. Morton, General Manager of the Great Southern Railway, and Mr. O'N. Vadhaigh. Mr. Carter, business manager of O.A.S., was also on board.

Capt. H. G. Travers has joined Imperial Airways as Assistant Air Superintendent, and he has been seen flying

Commercial Aviation

around in the Westland Wessex quite a bit lately. It is supposed that he will be instructing in the Imperial Airways preparatory school, in which there are now some 40 or 50 "boys."

Somebody who has recently gone gay to the extent of seeing Mr. H. G. Wells' film and also the new Imperial flying boats at Rochester was standing on the tarmac recently when quite a number of assorted British biplanes were on view. Rather unkindly, considering the stout work many of these types have done, he murmured, "Shape of things to go," and turned aside to have a look at a Swissair Douglas. A. VIATOR.

The Hong Kong Service

A WEEKLY air mail service to Hong Kong started on March 14, the latest time of posting being 10.45 a.m. on Saturday in London. The first mails will be due to reach Hong Kong on March 24 and each return service will leave on Friday and will be due to reach London on Monday ten days later.

Seeing the "Queen Mary"

NORTHERN and Scottish Airways have made arrangements to run their Renfrew, Skye and South Uist service on Monday, March 23, and Wednesday, March 25, instead of on the Tuesday and Thursday as scheduled, in order that visitors from the islands may have a chance of coming over to see the *Queen Mary* on its way down the Clyde on March 24.

After Three Years

HAVING completed its thirtieth crossing of the South Atlantic, the Bleriot four-engined flying boat *Santos Dumont* has been taken by Mermoz to the Etang de Berre for a complete overhaul. This Atlantic veteran made its first flight at Caudebec-en-Caux in June, 1933, and first crossed the South Atlantic from Dakar to Natal on November 27, 1934.

Guernsey's Aerodrome

A MEETING of owners of the land on which it is proposed to establish Guernsey's official aerodrome was called last week to confer with the Crown Officers and to hear the terms upon which the latter wish to purchase their property.

The proprietors, most of whom are farmers, although one is a director of the existing privately owned local aerodrome, unanimously refused the offer made to them, and it is expected that the matter will be taken before an arbitration committee, although the States of Guernsey have the power to expropriate the land if no more amicable settlement is attained.

Civil Inspection

THE majority of people will be surprised to know that the Joint Aviation Advisory Committee of Lloyd's Register and the British Corporation Register continue to be responsible to the Air Ministry for the inspection of the majority of civil aircraft.

As Mr. M. E. Denny, C.B.E., remarked at the annual meeting of the B.C.R. last week, both societies informed the Ministry in June, 1935, that they could not continue the work under the autonomous governing body proposed by the Gorell Committee. At the time the Ministry had not organised a new body and had no option but to ask the societies to carry on. "It would be difficult," said Mr. Denny, "to predict how long this state of affairs will continue, but we anticipate being in the business for at least the remainder of the present year."

Misr Airwork's Year

DURING 1935 as many as 6,990 passengers were carried on Misr Airwork's various services, in addition to 21,830 kg. of freight. Altogether, 419,467 miles were flown on regular services.

Preparedness

BIRKETT Air Service and Air Commerce both have aeroplanes stationed in the Rhineland on Press duty. British-American Air Services have already booked sixteen passengers on their special services to the Grand National on March 27.

Plymouth—Jersey

ON Friday, April 3, Jersey Airways are starting their expected service between Plymouth and Jersey, once each way, to run twice weekly on Tuesdays and Fridays. The Heston to Jersey services will be increased to twice daily for the Easter holiday, April 9-14. They will then revert to once daily until May 29, when twice daily services, commencing with the Whitsun holiday, will re-open and be maintained until the end of September.

Educating the Ratepayers

AFTER a lecture on air transport developments delivered by Capt. E. I. Short before the Eastbourne ratepayers' association not a single member of the audience spoke against the provision for reserving an aerodrome site. Some four hundred people were present, and there had previously been considerable antagonism concerning the project.

In the course of his lecture, Capt. Short remarked that nearly 75 per cent. of the aerodromes, both here and abroad, had been provided by the local authorities. A number of *Flight* photographs of machines and airports were shown on the screen.

Decoys

COMMERCIAL AIR HIRE AND AIR DISPATCH are participating in the Army co-operation with the 1st Division of the R.A. during the present manœuvres. The machines used are Airspeed Envoys and Monospars, which are required to fly over the London area both day and night. When the pilots have reached the specified height searchlight crews endeavour to spot them. Four machines are in the air at once, and the Government contract is expected to continue until the month of June. Flt. Lt. Eric Noddings, who, while in the R.A.F. did exceptionally fine work with the Meteorological Flight at Duxford, is in charge.

Two new pilots—Mr. Roland Falk and Mr. F. J. Birmingham—have been engaged and Air Dispatch have announced that their summer service to Le Touquet will commence on April 10. Outward bound machines will leave on Fridays and Saturdays, returning on Sundays and Mondays. The Inner Circle Air Line will also re-open next month.

SALVAGE: This Junkers W.34, owned by Canadian Airways, fell through the ice while taxying near Port Chipewyan and was saved from complete immersion only by the low wing structure. Twelve days were taken in the work of salvage, but comparatively little damage was done.

ANOTHER STEP FORWARD

Unsurcharged Air Mail Abroad : British Airways' Scandinavian Contract

WHEN an almost unprecedented number of Important Personages and Press representatives turn out on a cold and foggy morning for a ceremony at 8.30 a.m. it can be taken that this ceremony marks an important occasion.

For the first time in the history of air mail transport, letters and postcards are now being taken by air out of this country at the standard postage rate, and on Tuesday morning a British Airways' D.H.86, with Capt. Anderson in command, left Heston for Copenhagen and Malmo with the first batch.

Short speeches were made by the Assistant Postmaster General, Sir Walter Womersley, M.P., by Sir Francis Shelmerdine, by Mr. W. D. L. Roberts, the chairman of British Airways, and by the Minister for Norway, M. Erik Andreas Colban. Afterwards, Sir Walter presented the air mail pennant. Special letters were then franked, placed in special bags and these, with the more ordinary bags, were stowed.

Soon after 9.15—it is a pity that ceremonial should delay so important a matter as the departure of a regular air service—the machine was taxied out into the ground mist and taken off safely, but out of sight. One always breathes a sigh of relief after such occasions, since a tiny taxying misjudgment can so easily wreck an impressive ceremony—not to mention an expensive aeroplane. With Capt. Anderson on the inaugural service were Messrs. Gill, Robinson and Duff, respectively first officer, radio operator and service engineer. Major McCrindle, the managing director of British Airways, travelled as a passenger.

Incidentally, during the first two months of this year the Paris passenger figures of British Airways have been 100 per cent. better than those of the same months of last year. During the Easter holiday period, from April 9 to 14, a special Paris time-table will be in operation with as many as three return services on certain days.

Captain Anderson, chief pilot of British Airways, receives the air mail pennant. (*Flight* photograph.)

Navigation

THE full address of the Imperial School of Navigation, referred to in *Flight* last week, is 87, Notting Hill Gate, W.11.

D/F at Darwin

A DIRECTION finding station has now been established at Darwin. The call sign is VMO and the wavelength is approximately 900 metres. This station will maintain a continuous watch whilst aircraft are flying the Darwin-Koepang sector.

New Finnish Service

EFFORTS are being made in interested circles to open an air line between Helsingfors and Reval (Tallinn). At present Finland has only one air line linking her up with Europe, that which goes *via* Stockholm. It is believed that the Government will support the projected line to Tallinn, since it will afford an opportunity to send Finnish mail by an alternative route.

The Saigon Ready

THE first of the three-engined Breguet flying boats of the Saigon type, ordered by Air France for their Marseilles-Algiers daily service, completed its final tests on January 30, and has just finished the hundred hours' preliminary flying demanded by the French Air Ministry before a machine can carry passengers. This machine will accordingly start its regular commercial work on the route forthwith.

The boat is fitted with three 860 h.p. Hispano Suiza moderately supercharged and geared motors and is fitted with v.p. airscrews. It is the prototype of a series destined for the 500-miles daily crossing of the Mediterranean between Marseilles and Algiers—a route which for some years remained the longest sea crossing regularly operated by any air line. It has a first class saloon for six passengers, a second class saloon for eleven passengers, and a "cabin de luxe" for two. Further accommodation includes a "lavabo" kitchen and a commodious luggage compartment. It cruises at 137 m.p.h. Number one of the series has been baptised *L'Algerie*.

Charter Speed

AN American doctor, due in Paris at 6 p.m. recently for an urgent operation, missed the British Airways service at 1.45 owing to the non-arrival of his instruments, which were to follow him to Heston. Birkett Air Service was called in, and he and his anæsthetist left in the Merlin at 3.45. They reached Paris at 5.25, after an hour and forty minutes' flying. A slower machine would not have got them there in time.

A Dragonfly for the King of Iraq

HIS MAJESTY KING GHAZI of Iraq has purchased a D.H.90 (Dragonfly), so that in future he need not always proceed by the military aircraft of the Royal Iraq Air Force. King Ghazi (writes a Baghdad correspondent) has always been air-minded; he flew with his father, the late King Feisal, and notably with the Royal Iraq Air Force, at the head of five Hawker aeroplanes for the opening of the Kirkuk-Mediterranean pipe line last year.

The King has chosen the standard Dragonfly (described in *Flight* of January 23), fitted with two Gipsy Major engines, a craft which cruises at 125 miles an hour and has a top speed of 144-147 m.p.h. The normal layout provides two pilots' seats, side by side, with three seats behind, and a luggage compartment separate from the cabin.

To be named *The Golden Eagle*, King Ghazi's machine will have wings and fuselage finished in gold, and the golden crown of Iraq will embellish each side, while the international markings are to be in Arabic.

Interior details include a seat-type Irvin parachute, a table, luncheon basket, bookcase and ashtrays.

Among the instruments are Smith drift sights and—standard equipment on this machine—an Air Log, Sperry artificial horizon and directional gyro, and Husun compass. A Rotax landing light is fitted.

His Majesty has decided that a range of 646 miles is sufficient. He has therefore dispensed with the auxiliary standard tank, which would increase the range to 906 miles.

It is expected that the makers will fly the machine out next month, when it will be delivered at one of His Majesty's two private landing grounds near Baghdad.

THE INDUSTRY

Mr. Leonard Morgan

MR. LEONARD MORGAN'S many friends in the aircraft industry will be interested to hear that he has been appointed assistant aviation manager to K.L.G. Sparking Plugs, Ltd. He will continue to look after K.L.G. publicity in the aviation field.

Quadrilingual

THE Cirrus Hermes Engineering Co., Ltd., Brough, Yorkshire, have issued specifications of the latest Cirrus Minor engine (described in *Flight* of February 20) in English, French, German and Spanish. Incidentally, fifty of these engines are at present going through the shops.

Hatfield in Your Pocket

AFTER De Havilland V.P. airscrews, a V.P. catalogue, the initials in this instance signifying "vest pocket." The second edition of this sixty-page pocket booklet deals briefly with the entire range of the company's products, and its flying activities. It includes performance and dimension data for all De Havilland machines, illustrations of each type, and pictures of the works and aerodrome.

It is probable that a third edition of this excellent and most interesting little work will appear later in the year when the new series of Gipsy engines go into production.

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

CARDEN AERO ENGINES LTD.—Private company, registered March 11. Capital, £1,000 in £1 shares. Objects: to carry on the business of aeronautical, other engineers, etc. Directors: Lady Dorothy M. Carden, Carwarden House, Camberley, Surrey; H. Sydney Wright, 18, Bloomsbury Square, London, W.C.1; S. V. Appleby (Managing Director). Solicitors: H. S. Wright and Webb, 18, Bloomsbury Square, London, W.C.1.

AIR CRUISES LTD., was registered as a private company on March 9, with a nominal capital of £6,000 in 5,000 6 per cent. cumulative preference shares of £1 each and 4,000 founders' ordinary shares of 5s. each. Objects: to acquire seaplanes and other aircraft, and to carry on the business of aeronautical engineers, air transport agents, carriers of passengers and goods, etc. The directors are: Amy Mollison (permanent managing director and chairman), The Gate House, Ennismore Gardens, London, S.W.7; Robt. O. Reynolds, 7, Wheathill Road, London, S.E.20. Registered office: 21, Bucklersbury, London, E.C.4.

DART AIRCRAFT LTD.—Private company, registered March 11. Capital, £5,000 in 40,000 6 per cent. cumulative participating preference shares of 1s. each and 2,000 ordinary and 1,000 deferred shares of £1 each. Objects: to acquire the business of light aircraft manufacturers now carried on by Zander and Weyl, at Luton Road, Dunstable. Directors: Archibald J. Lucas, Chaddlesworth, Berks; Eric P. Zander, Luton Road, Dunstable; and Alfred R. O. Weyl, Luton Road, Dunstable. Registered office: Luton Road, Dunstable.

PERSONAL AIRWAYS LTD.—Registered as a private company on March 9 with a nominal capital of £10,000 in £1 shares. Objects are to carry on business as carriers of passengers, goods and mails by air, etc. The directors are: the Hon. Peter R. L. Beatty, 17, Grosvenor Square, London, W.1.; the Hon. Peter Pleydell-Bouverie, Honington House, Salisbury, Wilts. Registered office: The Airport of London, Croydon, Surrey.

PUTTNAM AIRCRAFT CO. LTD.—Registered as a private company on March 11 with a nominal capital of £500 in £1 shares. Objects: to acquire interests in any patents relating to the manufacture of aircraft, and to carry on the business of manufacturers of and dealers in aeroplanes, etc. The life directors are: Samuel W. Soden, 14n, Richmond Bridge Mansions, Twickenham; Dr. Harold A. Tracey, Carrington House, Hertford Street, London, W.1; Mrs. Gertrude E. Soden. Secretary: Miss Miriam E. Cramb, 1, Hanover Street, London, W.1.

MIRIS STEEL CO. LTD. was registered as a public company on March 11 with a nominal capital of £400 in 480 6 per cent. cumulative redeemable preference shares of 10s. and 1,600 ordinary shares of 2s. each. Objects: to carry on the business of manufacturers of special high-grade armament and bullet-proof steels, aircraft, motor car, industrial and carbon steels for all purposes by the Miris process, etc. First directors not named. Solicitors: E. R. Mellor and Co., 8, Gt. Winchester Street, London, E.C.2.

THE FURNESS GLIDING CLUB PROPRIETARY LTD. was registered as a private company on March 13 with a nominal capital of £100 in £1 shares. The objects are to promote and assist and encourage gliding, etc. The directors are: Chas. W. Craven, Abbey House, Barrow-in-Furnesss; John Fisher, "Drumard," Barrow-in-Furness; Joseph S. Redshaw, 18, Fairfield Lane, Barrow-in-Furness; Robert Cuthell, 31, Church Street, Barrow-in-Furness. The registered office is at 5, Lawson Street, Barrow-in-Furness.

THE LEICESTERSHIRE FLYING POU CLUB LTD., was registered on March 11, as a company limited by guarantee without share capital, with not more than 100 members, each liable for 5s. in the event of winding-up. The objects are to acquire the assets and take over the liabilities of the unincorporated association known as "The Leicestershire Flying Pou Club," to promote and encourage the study and practice of aviation in all its branches with particular reference to light machines of the Flying Flea type. The management is vested in a committee the first members of which are: Alfred J. Bridge, Albert E. Brooks, Victor H. Dorse, Wm. M. Fraser, Leonard P. Harries. Hon. Joint Secretaries: Alfred J. Bridge and Wm. M. Fraser. The registered office is at 16, New Street, Leicester.

INCREASES OF CAPITAL

WESSEX AIRCRAFT ENGINEERING COMPANY LTD. (High Post Aerodrome, Middle Woodford, Salisbury).—The nominal capital has been increased by the addition of £5,000 beyond the registered capital of £700. The additional capital is divided into 5,000 6 per cent. irredeemable cumulative preference shares of £1.

AERO ENGINES LTD. (Kingswood, Bristol).—The nominal capital has been increased by the addition of £125,000 beyond the registered capital of £275,000. The additional capital is divided into 500,000 ordinary shares of 5s. each.

YAPTON AERO CLUB, LTD. (Ford Aerodrome, Yapton, Sussex).—The nominal capital has been increased by the addition of £1,000 in £1 ordinary shares beyond the registered capital of £1,000.

BRITISH SCANDINAVIAN AIRWAYS LTD. (Grand Buildings, Trafalgar Square, London, W.C.)—The nominal capital has been increased by the addition of £29,900, in £1 ordinary shares, beyond the registered capital of £100. This is a private company registered on October 19, 1935, to establish and carry on aerial communication between Great Britain and Scandinavia. The directors are: Rt. Hon. The Earl of Halsbury; Col. J. T. C. Moore-Brabazon, M.P.; Lancelot W. Dent, and Martin Fountain Barber.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

(*Published March* 19, 1936).

23862. AIR LOG CO., LTD., and MAYERS, H. C.: Time-integrating instruments, particularly for aircraft (442,946).

30992. REID, G. H.: Gyroscopic aircraft instrument (442,911).

3608. ELIA, COUNT G. E.: Apparatus for dropping armed vehicles and other articles from aircraft (442,973).

4089. ARMSTRONG WHITWORTH AIRCRAFT, LTD., SIR W. G. LLOYD, J. MURRAY, C.V., and BATCHELOR, J. W.: Servo devices for use in the control of watercraft or aircraft (443,178).

25086. CESKOMORAVSKA-KOLBEN-DANEK CO., LTD., and SLECHTA, J.: Aircraft (443,005).

HOMING: In the latest version of the R.T.E. visual homing equipment a goniometer can be incorporated to enable bearings to be taken while flying on a fixed course. This equipment was demonstrated last week at a special Plessey exhibition in London. There also could be seen a very neat aircraft remote control panel which has recently been developed.